San Francisco Central Freeway Replacement Project

Environmental Assessment

pursuant to
42 U.S.C.4332(2)(C)

APR 3 1997
SAN FRANCISCO
PUBLIC LIBRARY

U.S. Department of Transportation
Federal Highway Administration

and

State of California
Department of Transportation

April 1997

REF
388.411
Sa5282

DOCUMENTS DEPARTMENT

5/S

SAN FRANCISCO
PUBLIC LIBRARY

REFERENCE
BOOK

Not to be taken from the Library

APR 1 5 1998

SAN FRANCISCO PUBLIC LIBRARY
3 1223 04647 8195

4-SF-101-4.7/5.1
4-0211-291000

SAN FRANCISCO CENTRAL FREEWAY REPLACEMENT PROJECT

Environmental Assessment

Pursuant to :

42 U.S. C. 4332 (2) (C)

U. S. Department of Transportation
Federal Highway Administration

and

State of California
Department of Transportation

D W Reynolds — March 28, 1997

Darnall W. Reynolds, Chief
Division of Planning
California Department of Transportation
District 4

Date

John R Schultz — 4-1-97

for **David H. Densmore, Division Administrator**
Federal Highway Administration
California Division

Date

Preface

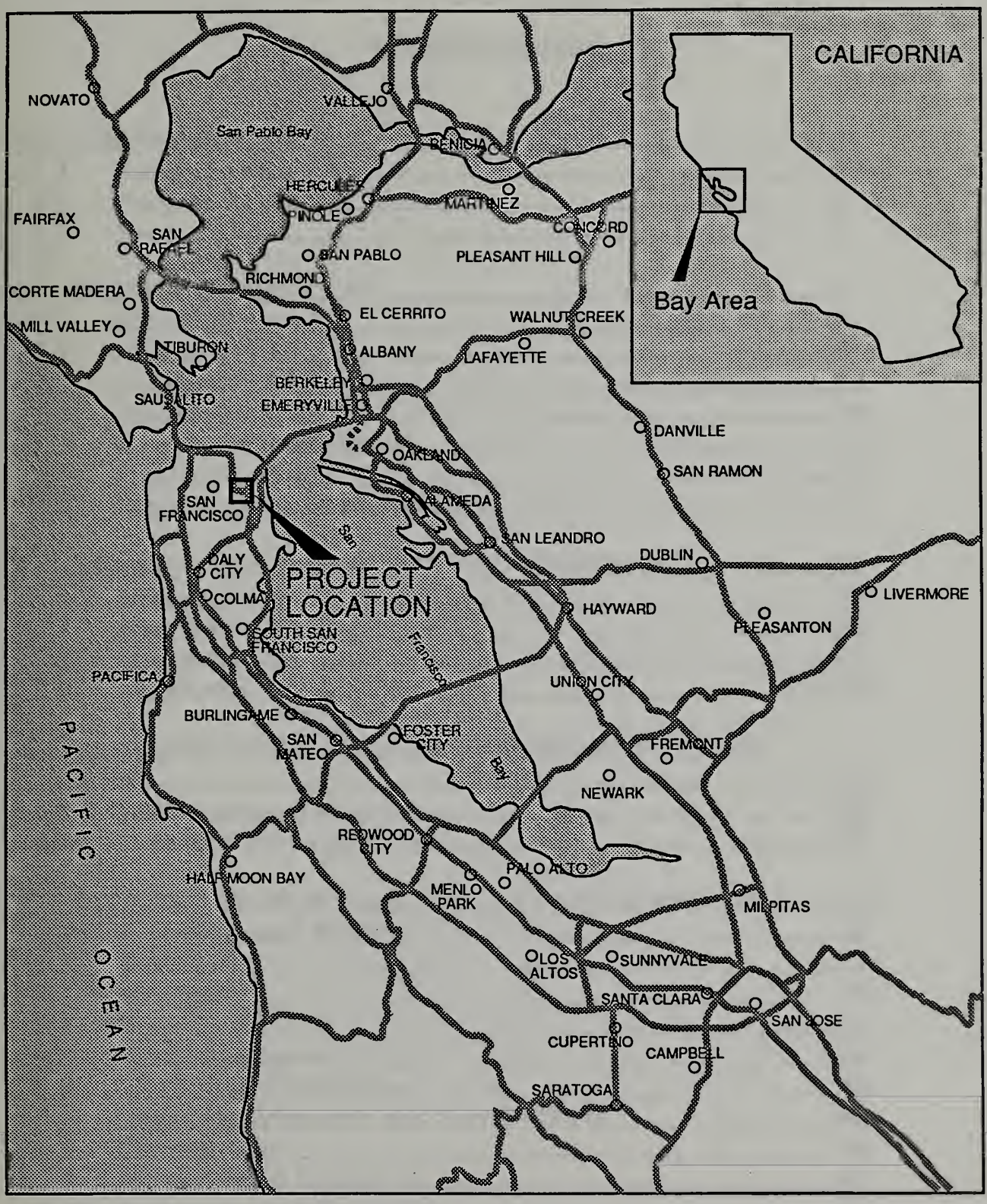
The Federal Highway Administration is the federal lead agency for this project, which is subject to the National Environmental Policy Act (NEPA). This project is statutorially exempt from the California Environmental Quality Act (CEQA), pursuant to California Public Resources Code Section 21080 (b) (2), (3) and (4) and 21172. This legislation was signed into law following the Loma Prieta earthquake in 1989. The intent of the legislation is to expedite the construction of seismic retrofit projects by excluding them from CEQA.

REF 388.411 Sa5282

San Francisco Central
Freeway replacement
1997.

3 1223 04647 8195

S.F. PUBLIC LIBRARY



Central Freeway Replacement Project	Regional Location Map	Exhibit 1
Caltrans		

Table Of Contents

1.0 PURPOSE AND NEED....1
1.1 Background....2
1.2 Purpose....3
1.3 Need....3

2.0 PROJECT DESCRIPTION....7
2.1 Alternative 1A....7
2.2 Alternative 1B....8
2.3 Alternative 8B....11
2.4 Alternative 10....14
2.5 No-Project Alternative....14
2.6 Project Funding....17
2.7 Other Projects in the Vicinity....17

3.0 ALTERNATIVES CONSIDERED AND WITHDRAWN....19
3.1 Alternative 3....19
3.2 Alternative 8....20
3.3 Alternative 8A....20
3.4 Alternative 9....20

4.0 TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)....21
4.1 TMP Instituted Measures....21
4.2 Proposed TSM measures....23

5.0 AFFECTED ENVIRONMENT, IMPACTS AND MITIGATION....26
5.1 Environmental Setting....26
5.2 Seismicity....27
5.3 Air Quality....28
5.4 Noise....31
5.5 Visual Resources....36
5.6 Traffic and Circulation....44
5.7 Land Use, Economic and Social Effects....56
5.8 Right-of-Way....66
5.9 Architectural Resources....67
5.10 Archaeological Resources....72
5.11 Hazardous Materials....73
5.12 Energy....74
5.13 Conclusion....74

Table Of Contents (continued)

6.0 CONSULTATION AND COORDINATION.....75

7.0 BIBLIOGRAPHY 76

8.0 LIST OF PREPARERS.....77

Appendix

Summary of Central Freeway Areawide Traffic Study

Exhibits

Exhibit 1	Regional Location Map
Exhibit 2-a	Project Vicinty Map-San Francisco
Exhbit 2-b	Project Vicinity Map -Project Limits
Exhibit 3	Typical Cross Section-Alternative 1A, 1B and 8B
Exhibit 4	Project Layout-Alternative 1A
Exhibit 5	Typical Cross Section-Alternative 8B, Octavia Street Portion
Exhibit 6	Project Layout-Alternative 8B
Exhibit 7	Project Layout-Alternative 10
Exhibit 8	Project Layout-No Project Alternative
Exhibit 9	Typical Noise Sources
Exhibit 10	Visual Simulation 1
Exhibit 11	Visual Simulation 2
Exhibit 12	Visual Simulation 3
Exhibit 13	Visual Simulation 4
Exhibit 14	Traffic Study Area
Exhbit 15	Project Area Census Tracts
Exhibit 16	Project APE and Locations of National Register Eligible Properties

Tables

Table 1	Predicted Future Noise Levels Alternatives 1A, 1B, 8B and No Project Alternative
Table 2	Predicted Future Mitigated And Unmitigated Conditions Alternative 8b-Elgin Park
Table 3	Predicted Future Mitigated And Unmitigated Conditions Alternative 8b-Octavia Street (eastside)
Table 4	City Street Travel Times and Delays - Without Central Freeway
Table 5	Freeway Travel Times and Delays -Without Central Freeway
Table 6	Intersection Level of Service -Without Central Freeway
Table 7	Outbound City Street Travel Times and Delays - No Project Alternative
Table 8	Freeway Travel Times and Delays - No Project Alternative
Table 9	Outbound City Street Travel Times and Delays - Alternatives 1A and 1B
Table 10	Freeway Travel Times and Delays - Alternatives 1A and 1B
Table 11	Outbound City Street Travel Times and Delays - Alternatives 8B
Table 12	Freeway Travel Times and Delays - Alternatives 8B
Table 13 a-b	Project Area Population Characteristics
Table 14	Estimated Change in Distance of Eligible Properties from Proposed Freeway Structure and Finding of Effect - Alternative 1A
Table 15	Estimated Change in Distance of Eligible Properties from Proposed Freeway Structure and Finding of Effect - Alternative 1B
Table 16	Estimated Change in Distance of Eligible Properties from Proposed Freeway Structure and Finding of Effect - Alternative 8B

1.0 PURPOSE AND NEED

1.1 Background

The Central Freeway (U.S. 101) was constructed in 1959 as part of an overall freeway network system in the City of San Francisco, much of which was never built. As originally planned, the freeway system was intended to run north to Golden Gate Bridge and west to Golden Gate Park. Those projects were halted in response to strong citizen opposition and the freeway was ultimately terminated just west of Civic Center, with ramps at Franklin, Gough, Oak and Fell Streets.

The Central Freeway is an elevated single-deck viaduct that runs parallel to 13th Street between Route 80 and Mission Street. Until the recent demolition of the upper deck concrete structure for its remaining length, running from Mission Street to its terminus at Oak and Fell Streets. The freeway connects to Interstate 80, giving direct access to the East Bay via the San Francisco-Oakland Bay Bridge and Route 101 providing access to San Francisco International Airport and points south.

The Loma Prieta on October 17, 1989, had a profound effect on the Bay Area, causing the loss of human life and destroying millions of dollars worth of property. The transportation network also suffered extensive damage due to roadway structure failures; most significantly, the Cypress structure in Oakland and the San Francisco Oakland Bay Bridge. In San Francisco, the Embarcadero Freeway, portions of Route 280 and the Central Freeway were among the structures suffering extensive damage.

Immediately following the earthquake, the northbound portion of the Central Freeway leading to the Franklin and Gough Streets ramps were closed due to the severe structural damage. The ramps were finally demolished in early 1992. The remaining concrete portion of the Freeway from Mission to Fell Street was braced to provide interim seismic support in 1990.

Engineering design work began after the earthquake to develop a strategy that would seismically strengthen the remaining Central Freeway structure. A retrofit project was designed and planned for construction in 1994. Following public

hearings on the replacement of the freeway, the S.F. Board of Supervisors approved Resolution 541-92 in July, 1992. The Resolution made it the policy of the City of San Francisco not to build any new above ground ramps north of Fell Street to replace the demolished sections of the Central Freeway.

In August of 1996, Caltrans began demolition of the upper deck of the concrete structure from Mission to Oak Street. Caltrans decision to demolish the structure was based on the recommendations of the statewide Seismic Pier Review Panel. In 1995, that body determined that the double deck configuration of the Central Freeway posed a potential safety hazard and that removal of the upper deck should proceed to reduce the risk of structure collapse.

Demolition of the upper deck was completed in November 1996. The interim plan originally called for the demolition of the upper deck of the Central Freeway and reopening the lower deck to traffic; thus, restoring access to the Fell Street off-ramp. To mitigate the loss of access to the Central Freeway during the demolition and the interim loss of southbound access, a Traffic Management Plan (TMP) was instituted.

In October 1996, during the demolition phase, the City of San Francisco requested the Fell Street ramp remain closed pending the selection of a project alternative. The closure of the two lane segment remains in effect until April 14, 1997. The reopening of this segment was prompted by Caltrans' repaving project on 19th Avenue (State Route 1). The reopening of the Fell Street off-ramp will mitigate the decreased traffic handling capacity available on 19th Avenue during the repaving construction project and relieves traffic congestion on other local city streets.

1.2 Purpose

The earthquake damaged Central Freeway has resulted in the loss of a key transportation facility in the City of San Francisco. The purposes of the proposed project are as follows:

- Provide a facility that replaces or restores comparable service to the Central Freeway corridor;

- Provide a facility designed to withstand structural collapse during a major earthquake on the active faults within the area, thus providing greater safety to the general public and reducing property damage;

- Reduce congestion on those surface streets that Central Freeway corridor commuters have used for substitute access;

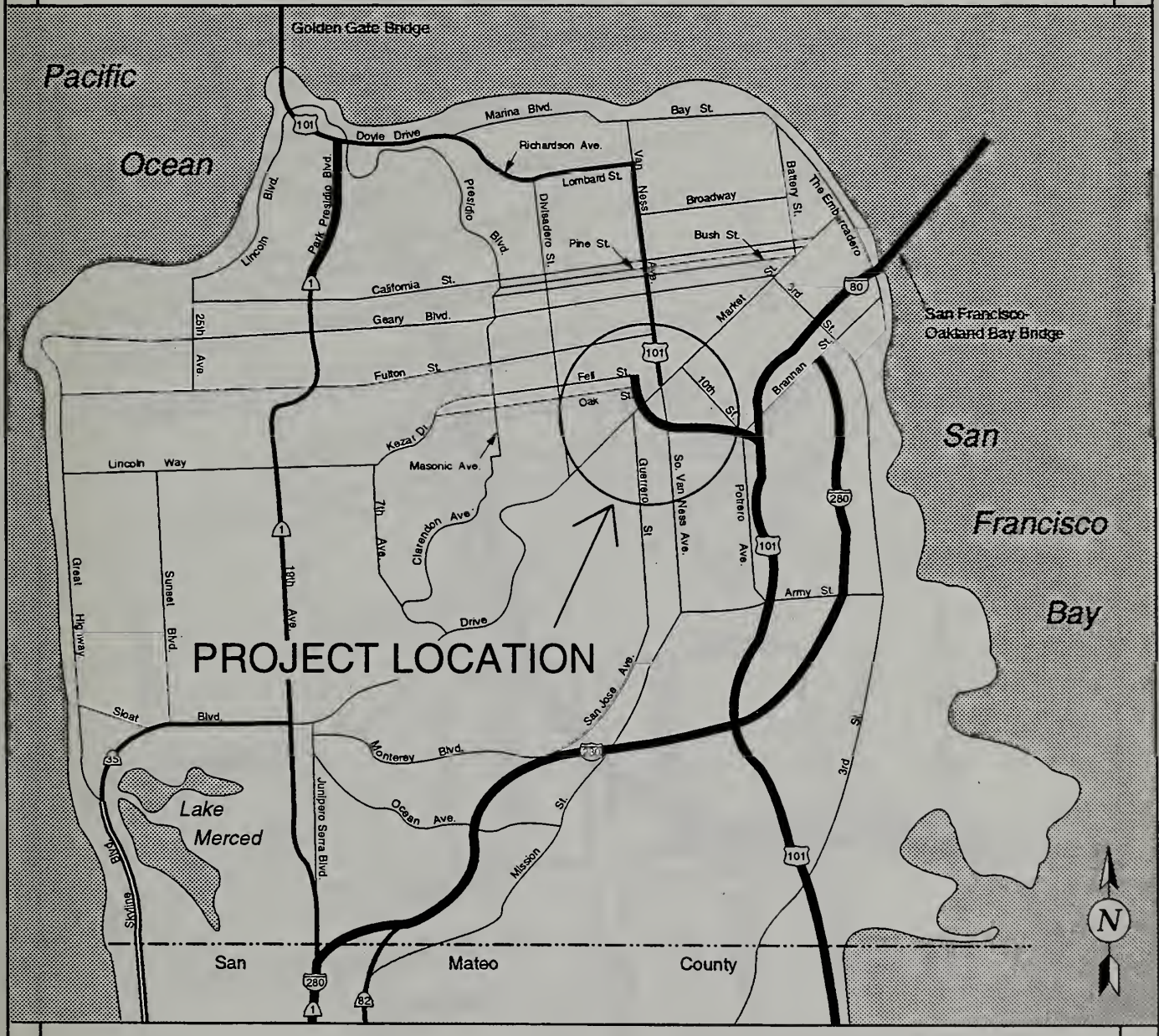
- Provide a facility that addresses regional transportation and mobility concerns while incorporating appropriate and feasible urban design principles in order to reduce the effects of the facility within affected communities.

1.3 Need

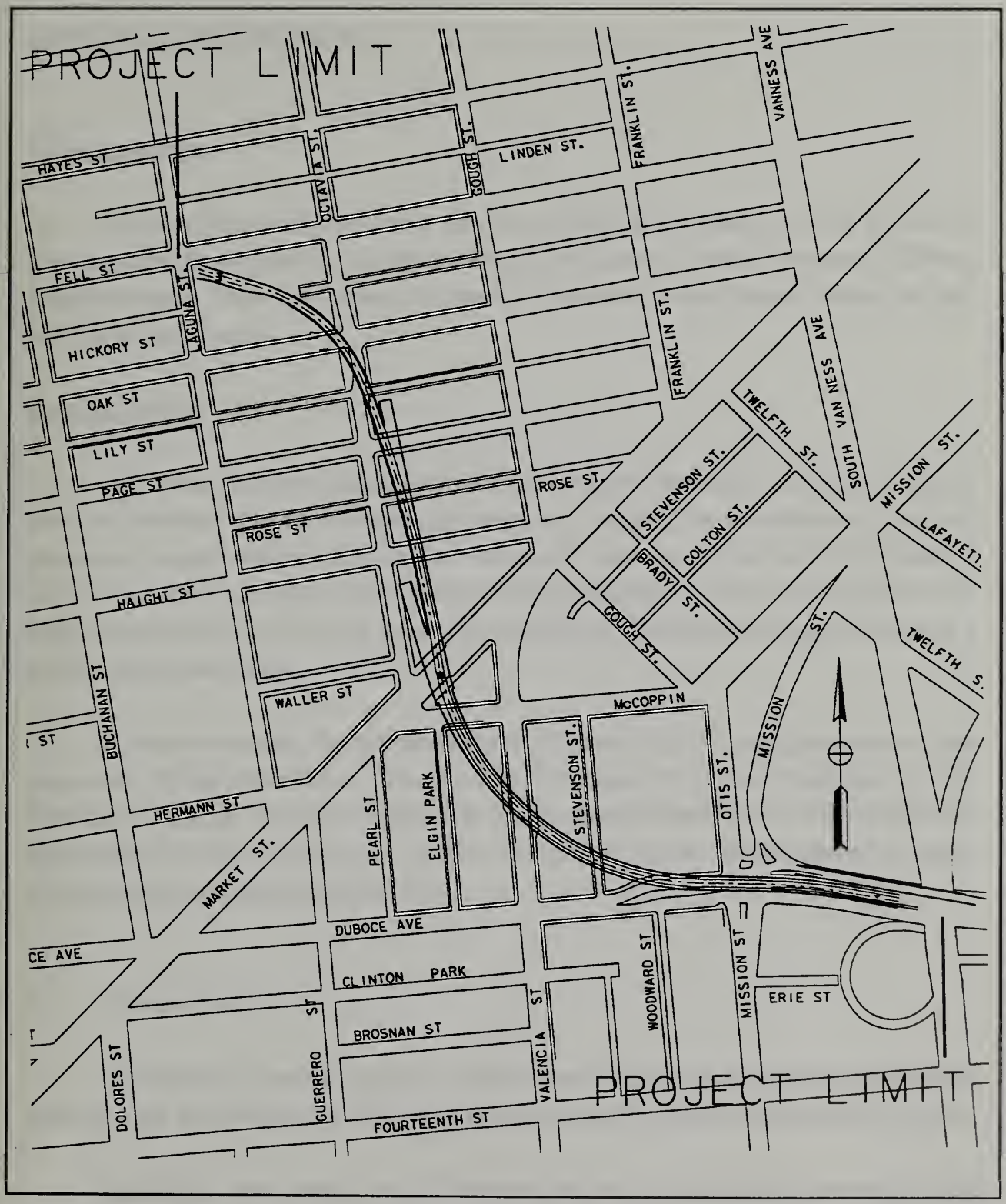
Prior to the 1989 Loma Prieta Earthquake, the Central Freeway carried approximately 100,000 vehicles per day over Market Street. The removal of the Franklin and Gough Streets ramps caused the daily traffic over Market Street to drop to approximately 80,000 vehicles per day and resulted in substantial changes in local street traffic volumes, affecting many arterials and key intersections. During the period when the viaduct over Market Street was closed, approximately 93,000 additional vehicles were added to surface streets or other freeway facilities in San Francisco.

The elimination of the Franklin and Gough Streets ramps in 1989, and the recent closure of the upper deck portion between Mission and Oaks Streets removed a major transportation facility from city's transportation network. This loss of total network capacity has resulted in increased average daily traffic on major arterials in the downtown area ranging from 11 percent to 28 percent. The increased volume has resulted in congestion on major arterials and key intersections in the downtown area and beyond. Some freeway ramps are also experiencing congestion.

While the Transportation Management Plan (TMP) that was implemented during the demolition of the upper deck proved successful in averting predicted freeway back-ups, the increased congestion now experienced on local streets is a



Central Freeway Replacement Project	Project Vicinity Map San Francisco	Exhibit 2 a
Caltrans		



Central Freeway Replacement Project

Caltrans

Project Vicinity Map
Project Limits

Exhibit 2 b

2.0 PROJECT DESCRIPTION

Project Location

The Central Freeway (Route 101) in the City and County of San Francisco extends from the Route 80/101 interchange to the Hayes Valley/Western Addition neighborhoods. Exhibits 2a and 2b show the location of the project within the city and the project limits.

Existing Facility

The freeway is an elevated steel viaduct over 13th Street for 1.28 km (0.8 miles) between I-80 and Mission Streets. It becomes a single 2-lane reinforced concrete structure between Mission Streets and the ramps located at Oak and Fell Streets, a distance of 88.5 km (0.55 miles). Prior to the demolition of the upper deck in late 1996, this section of the Central Freeway consisted of a southbound upper deck and a northbound lower deck.

In order to satisfy the purposes for the project, the following alternatives are proposed. These alternatives were developed by the City of San Francisco, the San Francisco Citizens' Advisory Task Force for the Central Freeway and the California Department of Transportation. Further discussion on the development of these alternatives is included in Section 3.0.

2.1 Alternative 1A

Alternative 1A would provide a new 4-lane single deck structure from Mission Street to Oak and Fell Streets including new on and off ramps at Oak and Fell Streets.

The 4-lane deck would be 23.77 meters (80') in width. Due to the single deck configuration, the freeway structure will be closer to some buildings, although within existing right-of-way. In both northbound and southbound directions there would be a 3.04 meter (10') shoulder, two 3.65 meter (12') travel lanes. There would be a 3.04 meter (10') median with a barrier separating northbound from southbound

traffic. Exhibit 3 provides a typical cross-section of the facility. This cross section will also apply to Alternatives 1B and 8B as well. The profile of this new structure would be slightly higher than the existing single deck structure.

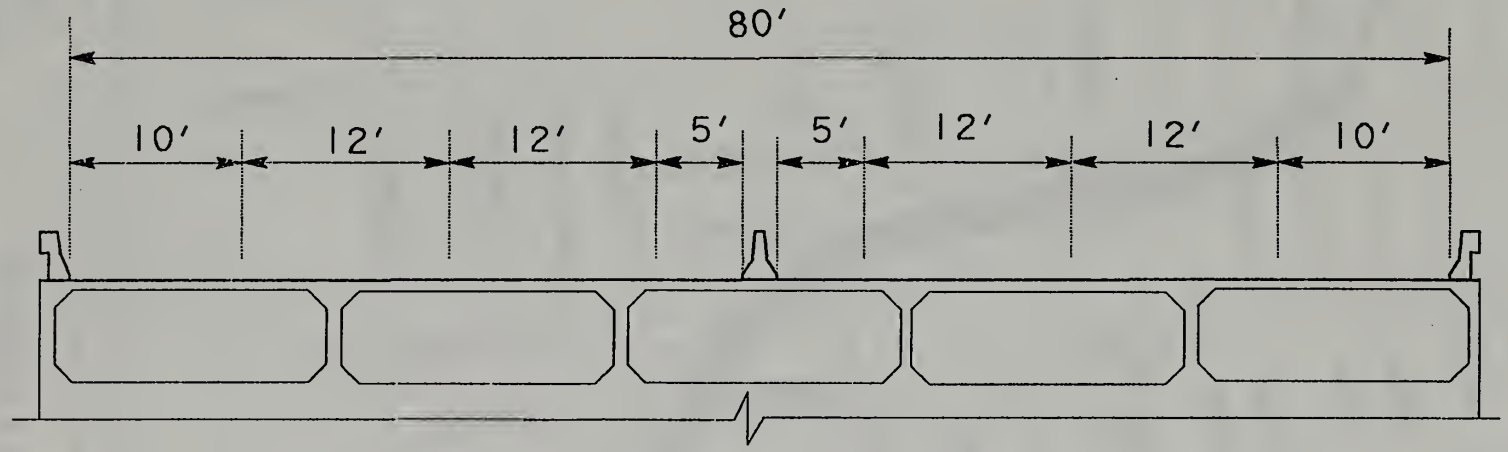
The estimated cost of this alternative is $49 million dollars. No new right of way would be required. Alternative 1A is shown in Exhibit 4.

2.2 Alternative 1B

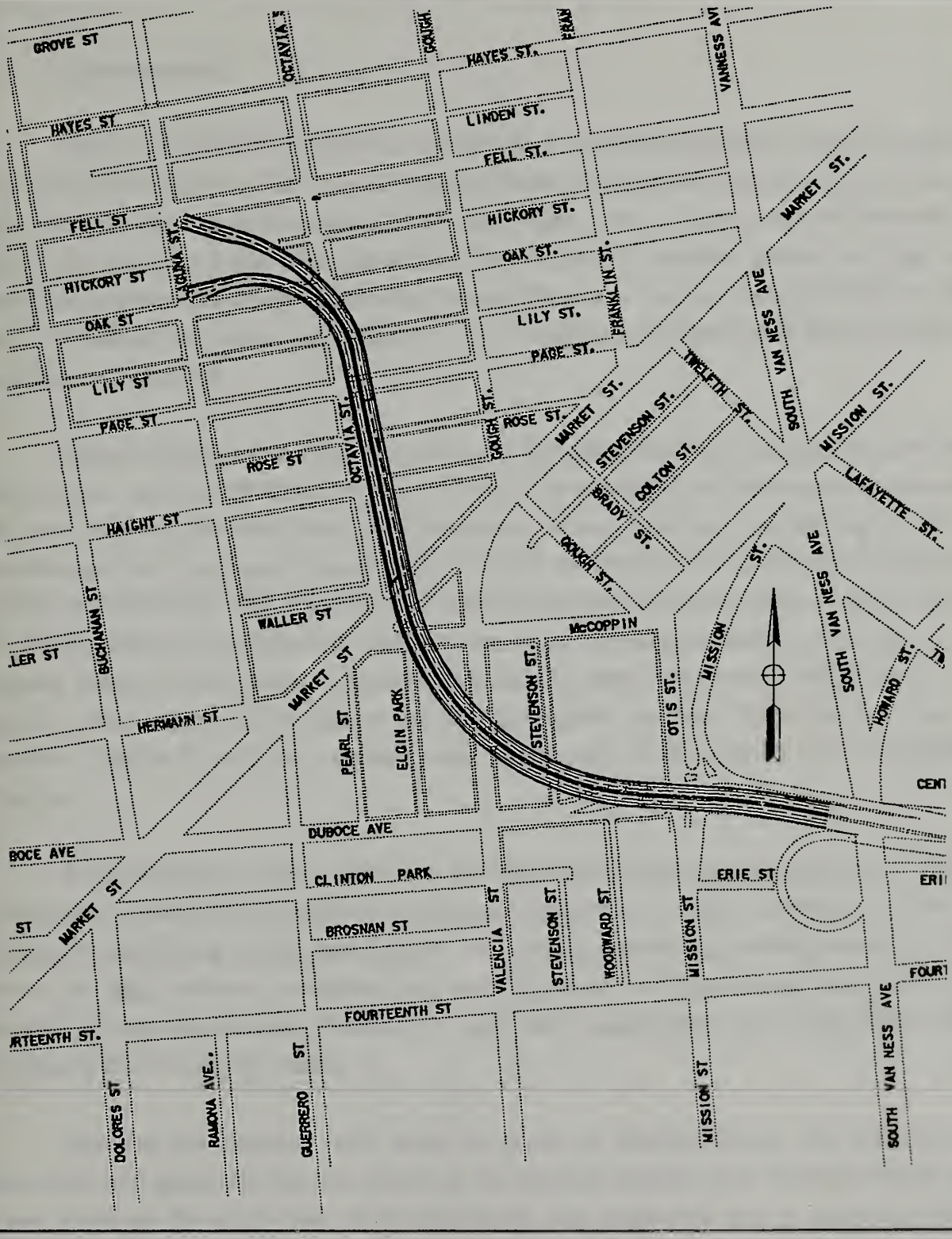
This alternative would retrofit and widen the existing lower deck of the Central Freeway, providing a 4-lane single deck structure from Mission Street to Oak and Fell Streets. From the intersection of Page and Octavia Streets to the Oak and Fell Streets ramps, the structure would be replaced rather than retrofitted.

The deck of the four lane structure would be 23.77 meter (80'). The typical cross section of the facility is shown in Exhibit 3. The elevation of the structure would be the same height as the existing 2-lane single deck structure. The alignment of this alternative is quite similar to that proposed under Alternative 1A. However, there are several locations at which alternatives 1A and 1B do not precisely conform with one another. Therfore, at certain locations the structure will be closer to, or further away, from particular buildings adjacent to the state right-of-way.

The cost of this alternative is $52 million dollars. No new right-of-way is required. Alternative 1B is shown in Exhibit 4



Central Freeway Replacement Project Caltrans	Typical Cross Section Alternatives 1A, 1B, and 8B	Exhibit 3



Central Freeway Replacement Project	Project Layout Alternatives 1A and 1B	Exhibit 4
Caltrans		

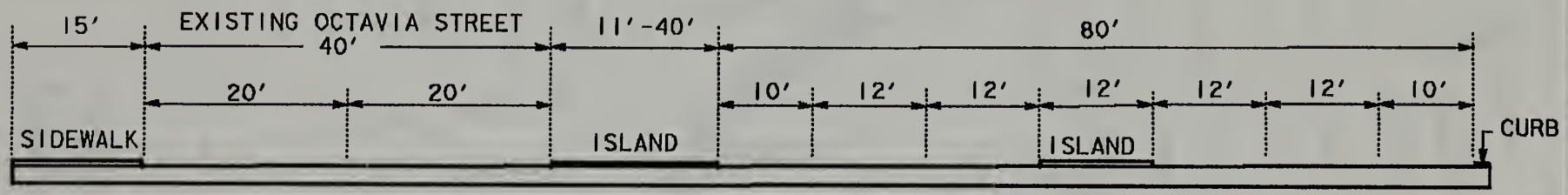
2.3 Alternative 8B

Alternative 8B would provide a single deck 4-lane facility from Mission Street continuing over Duboce Street and Valencia Street to the south side of Market Street near the intersection of McCoppin Street and Elgin Park. At this point the freeway will then come to grade at a signalized intersection on Market Street, serving as northern most entrance and exit to the Central Freeway. The new single deck would be 23.77 meters (80') wide. See Exhibit 3 for the typical cross section of the structural portion of the facility.

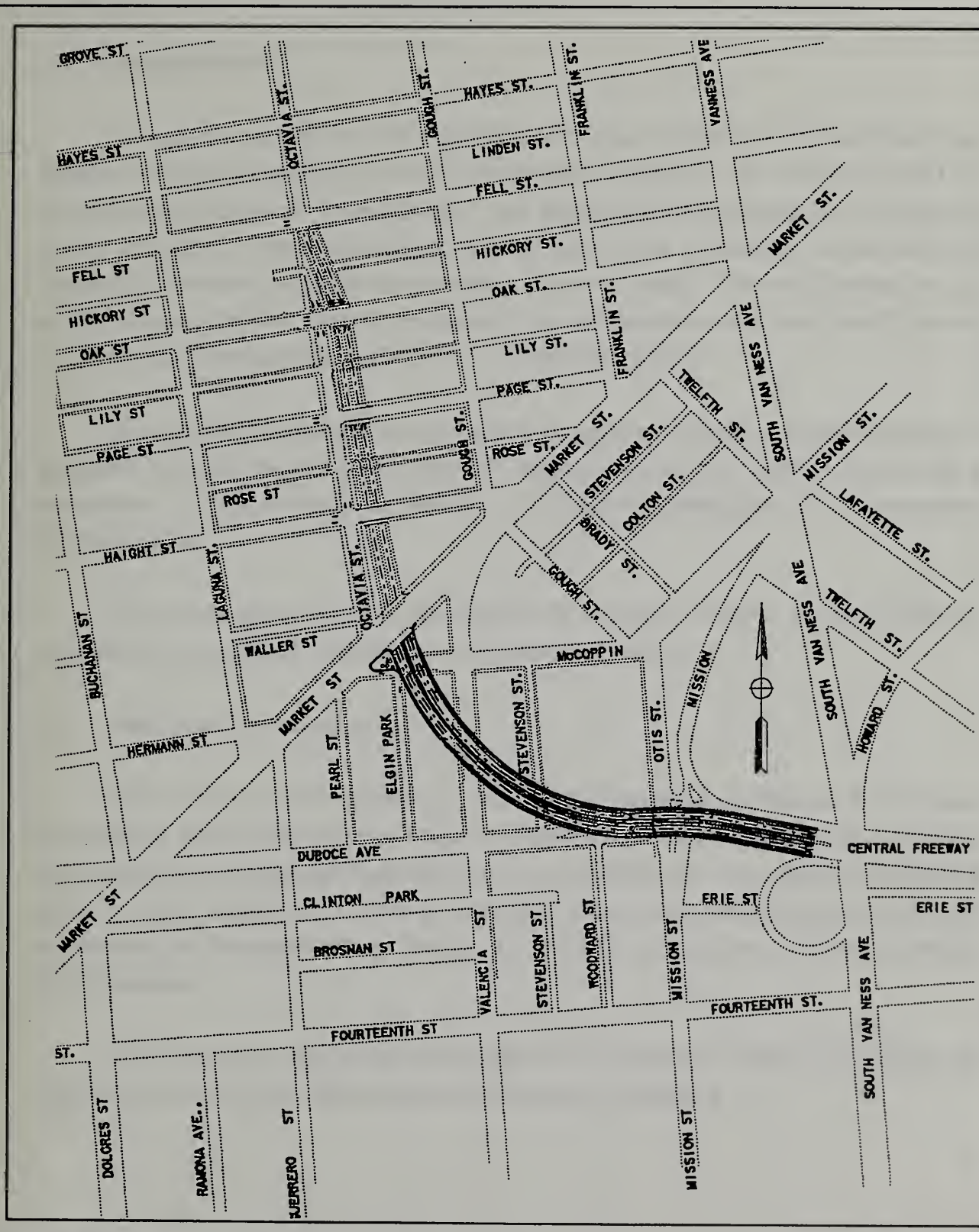
There will be no modifications to any of the ramps south of Market under this alternative. North of Market, the right-of-way now occupied by freeway structure on the east side of Octavia Street will become a 4-lane roadway, consisting of two northbound and two southbound lanes from the intersection of Market and Octavia Streets to Fell Street. The existing two north-south travel lanes on Octavia Street will be come one-way northbound traffic lanes from the intersection of Octavia and Market Streets to Oak Street. These lanes would be intended for local traffic use. A small curbed island will separate the two lane local roadway from the four-lane section. Exhibit 5 includes a typical cross section for Alternative 8B-Octavia Street Portion.

This alternative also includes a Transportation System Management (TSM) component. The TSM component is designed to improve traffic operations on local streets by modifying traffic signalization and timing, restricting parking during peak hours at high volume arterials and altering lane configurations and turning movements in certain areas. Section 4.0 includes a description of the TSM measures proposed under this alternative.

Because the freeway will come to grade at Market Street, the structural elevation will generally become lower as the viaduct crosses over Valencia Street to meet grade on the south side of Market Street. The estimated cost to construct this alternative is $34 million dollars. No new right of way is required. Alternative 8B is shown in Exhibit 6.



Central Freeway Replacement Project Caltrans	Typical Cross Section Alternative 8B, Octavia St.	Exhibit 5



Central Freeway Replacement Project	Project Layout Alternative 8B	Exhibit 6
Caltrans		

2.4 Alternative 10

Under this alternative, the existing two -lane structure that extends from Mission Street to Oak Street would be entirely removed. No viaduct would be constructed in its place. Operationally, this alternative is comparable to the existing traffic condition, where freeway access currently ends at Mission Street and the remaining two-lane northbound viaduct is closed to traffic. No modification to any of the existing freeway ramps is proposed under this alternative; nor would there a widened facility along Octavia Street for northbound traffic.

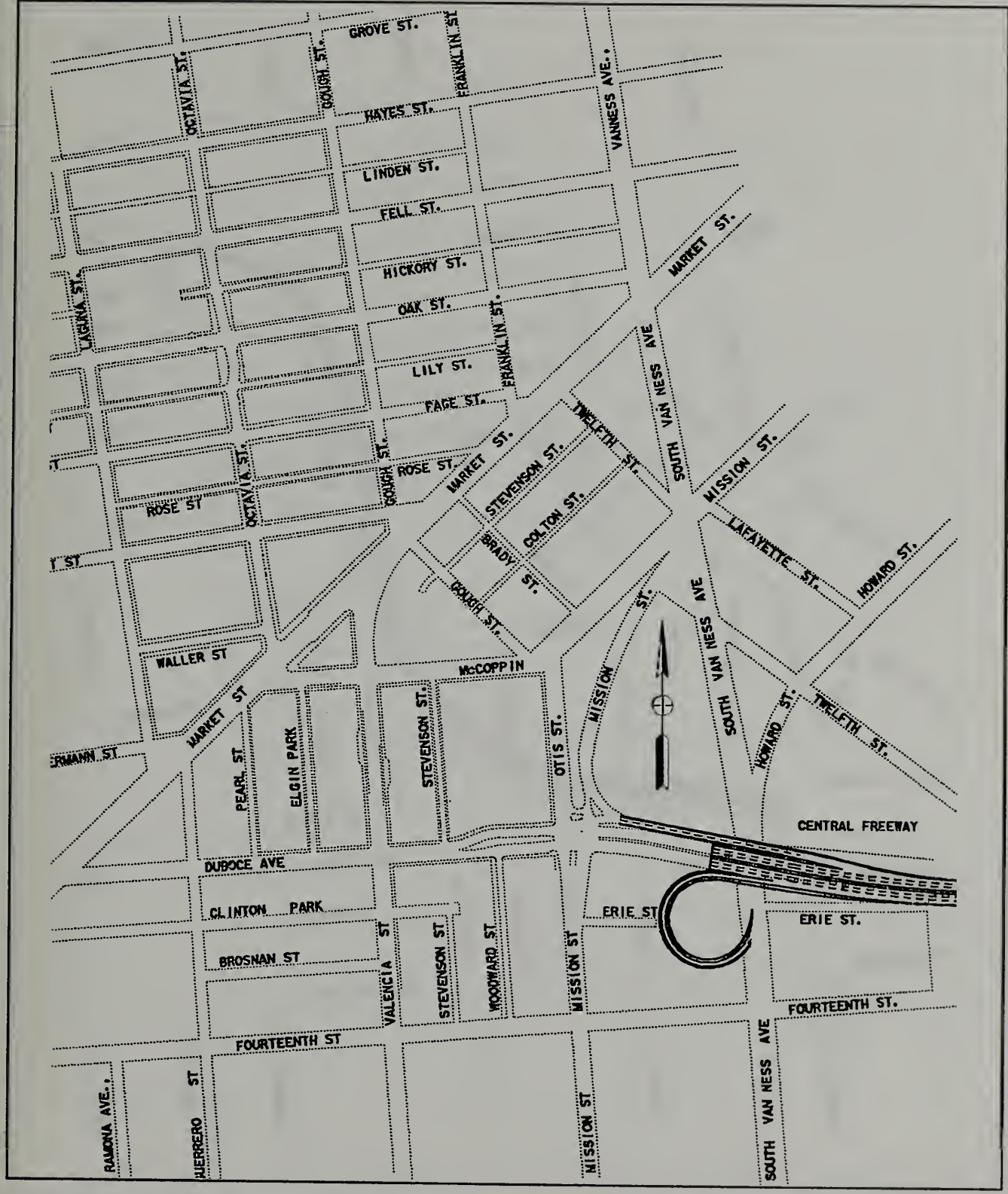
To address the permanent condition of increased traffic on local streets, a program of TSM measures to improve operations on local streets would be a component of this alternative. Section 4.0 includes a description of the proposed TSM measures.

The estimated cost of this alternative is $ 13 million dollars. No new right-of-way would be required. Alternative 10 is shown in Exhibit 7 .

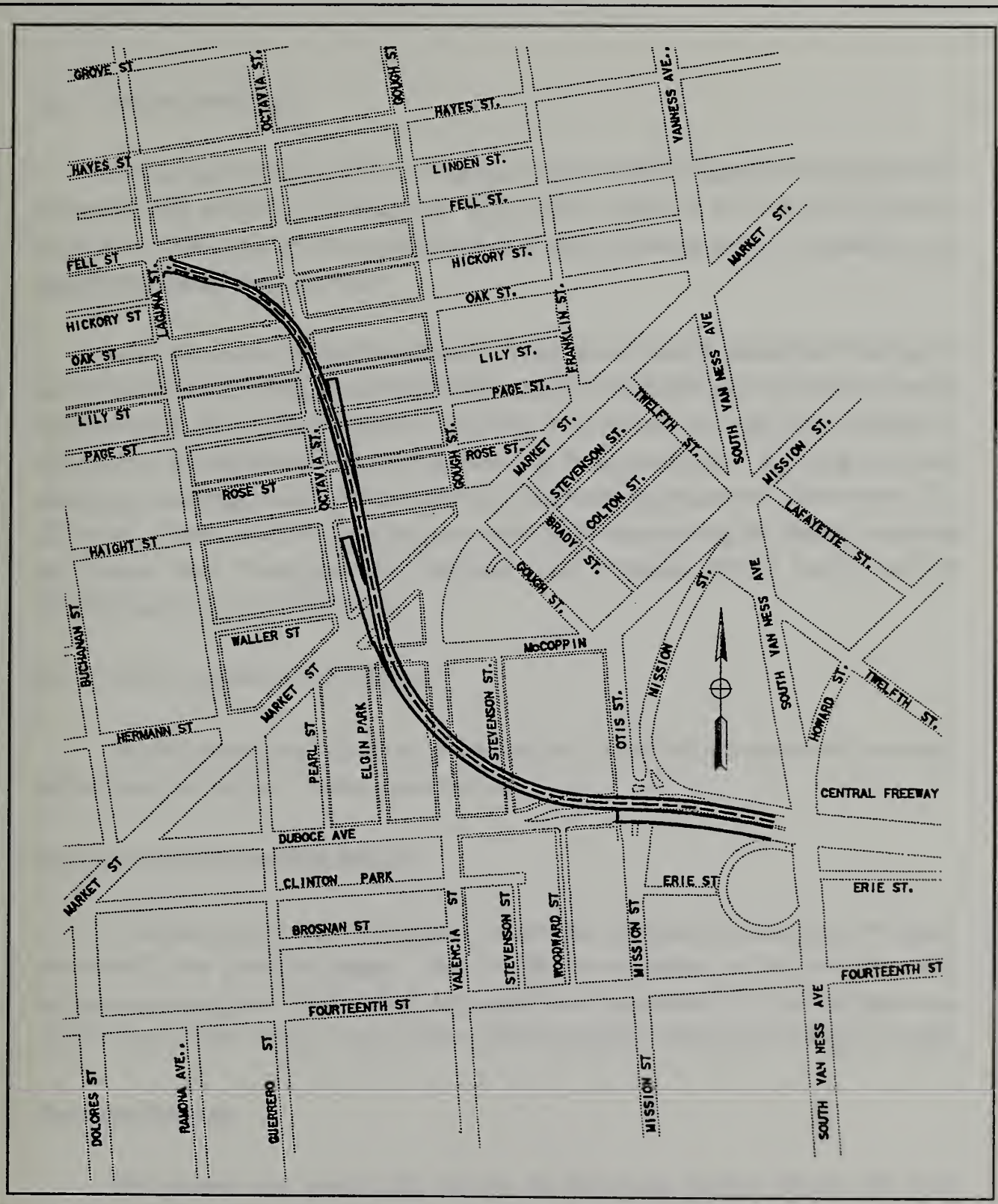
2.5 No-Project Alternative

This alternative proposes to retrofit the existing northbound structure providing a 2-lane viaduct from Mission Street to Fell Street. There would not be a southbound on-ramp from Oak Street under this alternative. As with Alternative 8B and 10 there would be a TSM to improve local street traffic operations as a component of this alternative. Section 4.0 includes a description of the proposed TSM measures.

The estimated cost of this alternative is $12.5 million dollars. No additional right-of-way is required. This alternative is shown in Exhibit 8.



Central Freeway Replacement Project	Project Layout Alternative 10	Exhibit 7
Caltrans		



Central Freeway Replacement Project	Project Layout No Project Alternative	Exhibit 8
Caltrans		

2.6 Project Funding

Following the Loma Prieta earthquake, the Federal Highway Administration allocated $40 million in Emergency Relief (ER) funds to the Central Freeway structure. The basis for this allocation was the estimated cost of repairing and retrofitting the affected structure.

After demolition of the Frankin and Gough Street ramps, removal of the upper deck, temporary shoring of the remaining structure and design and planning costs, approximately $17 million remains. For all of the alternatives, with the exception of Alternative 10 and the No Project Alternative, there would be a funding shortfall. Additional funding sources would need to be secured to implement Alternatives 1A, 1B or 8B. Other potential funding sources include augmenting ER funds, applying for future State Transportation Improvement Program (STIP) funds and/or identifying local revenue sources.

2.7 Other Projects in the Vicinity

The following major projects located in the City of San Francisco are currently in the planning stages or under construction.

San Francisco-Oakland Bay Bridge

A Seismic Improvement Program for the San Francisco-Oakland Bay Bridge is currently in the planning stages. The San Francisco portion of the project would include replacing most of the West Approach from the vicinity of the San Francisco Anchorage to Third Street. Construction on this project is scheduled to begin in 1997.

Bayshore Freeway

This project will seismically retrofit the Bayshore viaduct (Route 280 from Fourth Street to Sixteenth Street. Construction will begin in late 1997 and should be completed in 2000. The retrofit program will include enlarging structural footings and columns, adding new pipe piles, providing cross-bracing and encasing columns.

Central Freeway (steel portion)

This project will retrofit the steel portion of the Central Freeway fr om 17th Street to Otis Street. The project is currently under construction and is expected to be completed by January 1999.

Golden Gate Bridge

The project will undertake a complete seismic retrofit, to enable the 1.2 mile bridge to continue in service to following the maximum credible earthquake. Environmental approval for the project has been completed. The first of the four construction phases could begin in 1997.

3.0 ALTERNATIVES CONSIDERED AND WITHDRAWN

In November 1995, the City of San Francisco released the final Central Freeway Areawide Traffic Study, prepared by Wilbur Smith Associates. That report analyzed eight alternative concepts, which were presented in draft form on September 14, 1995. Following the public meeting, the San Francisco Board of Supervisors adopted a resolution recommending that alternatives 3, 8 and a "no project" retrofit be studied in the environmental process.

Eight alternatives, including a No- Project Alternative were presented at the November 20, 1996, public meeting, including the three recommended by the Board of Supervisors. Alternatives presented at that meeting were largely refinements of alternatives discussed in the Wilbur Smith report. These refinements addressed engineering and operational issues that could not have been contemplated in the earlier planning study. The original alternatives presented in the Central Freeway Areawide Traffic Study are summarized in the appendix.

Four of the eight alternatives presented at the November 1996 meeting are analyzed in this Environmental Assessment. Alternative 10 was added at the city's request, subsequent to the public meeting. The four alternatives not analyzed in this Environmental Assessment, but presented at the November 1996 meeting and subsequently withdrawn from consideration are summarized below:

3.1 Alternative 3

This alternative proposed a single deck 4-lane structure crossing Market Street, with a depressed segment between Haight and Page Streets. The Entrance to the freeway for southbound traffic would have been from a new Oak Street on-ramp. Northbound traffic could have used either a new off-ramp to Oak Street or exit at Fell Street. The cost of construction for this alternative was estimated at $80 million. This alternative would have required the acquisition of a construction easement for retaining wall footings along the easterly right-of-way line from Page Street to Oak

Street. Extensive relocation of utilities would have been required in the Haight and Page Street depressed segments. This alternative was withdrawn from further consideration due to unsafe stopping sight distances at the Oak and Fell Street exits.

3.2 Alternative 8

This alternative proposed to bring the freeway to grade with a signalized intersection at Market Street. North of Market Street there would have been a depressed segment between Haight and Page Streets, similar to Alternative 3. The existing Mission Street off-ramp would have been replaced by new off-ramps at Duboce and South Van Ness Avenue. The cost of construction and right-of-way for this alternative was estimated to be $100 million. This alternative would have required the acquisition of additional right-of-way for the off-ramps to South Van Ness and Duboce Avenues and a construction easement for the off-ramp to Oak Street. This alternative was withdrawn from consideration because the traffic benefit that would have been realized from the reconfigured ramps was not substantial enough to justify the cost.

3.3 Alternative 8A

This alternative is a variation of Alternative 8 with the northbound off-ramp terminated at Fell and Octavia Streets instead of at Fell and Laguna Streets as proposed in Alternative 8. All features and ramp configurations of the freeway south of Market Street are similar to Alternative 8. The cost of construction and right-of-way for this alternative was estimated at $100 million. Additional right-of-way for the off-ramps to Van Ness and Duboce Avenues and a construction easement would have been required. This alternative was withdrawn due to its excessive cost.

3.4 Alternative 9

This alternative proposed to end the freeway at Mission and Otis Streets, with a northbound off-ramp to South Van Ness Avenue and a southbound on-ramp from Otis Street. The estimated cost this alternative was $39 million. Additional right-of-way would have been required for the off-ramp to South Van Ness Avenue. This alternative was eliminated from consideration due to right-of-way considerations and engineering considerations.

4.0 TRANSPORTATION SYSTEM MANAGEMENT MEASURES (TSM)

Alternatives 8B, 10 and the No Project Alternative will include the TSM measures discussed in this section. Those measures which were implemented as part of the Transportation Management Plan (TMP) during the demolition of the upper deck will be retained.

4.1 TMP Instituted Measures

Measures already implemented in the Central Freeway area include intersection reconstruction and channelization changes, freeway ramp modifications, traffic routing changes, two new traffic signals, traffic signals timing changes, curb parking prohibitions and transit-only lanes. Intersection reconstruction and channelization changes were made at the Market, Fell, Polk, 10th Street intersection; South Van Ness Avenue, Howard Street intersection and the Market, 6th Streets intersection, as well as traffic routing and signage changes.

New traffic signals were installed at McAllister and North 7th Streets. Traffic channelization changes were made at the intersection of Mission Street/Dubuce Avenue/Otis Street/13th Street, along South Van Ness Avenue between Mission and Howard Streets (for local business access) and at the intersection of Van Ness Avenue/Hayes Street. Freeway ramp changes were made at the South Van Ness Avenue loop on-ramp to the eastbound Central Freeway in order to provide a two-lane on-ramp. Signal control for the free right turns from eastbound 13th Street to the southbound South Van Ness Avenue on-ramp is pending. Traffic signal timing changes were made at 22 traffic signals along the 9th, 10th, Fell, Hayes Street corridors to accommodate increased traffic volumes on these streets. Transit only lanes were installed on Market Street between 8th and 11th Streets in the westbound direction and between 12th and 5th Streets in the eastbound direction.

Temporary parking restrictions were implemented on many streets either immediately prior to or during the closure of the Central Freeway. Those locations

where parking restrictions were placed on entire block faces would continue under the subject alternatives. The affected locations and times are:

10th Street, east side, Market to Mission Streets, at all times;
Franklin Street, east side, Oak to Fell Streets, at all times;
Gough Street, east side, Page to Market Street, at all times;
Gough Street, west side, Hays to Fell Streets, at all times;
Van Ness Avenue, east side, Fell to Hayes Street, at all times;
South Van Ness Avenue, east side, Mission to Market, at all times;
Hayes Street, north side, Van Ness Avenue to Franklin Street, at all times;
6th Street, east side, Bryant to Market Streets, 7-9 AM;
9th Street, east side, Howard to Harrison Streets, 7-9 AM;
9th Street, both sides, Howard to Market Streets, 7-9 AM;
10th Street, south side, Franklin to Market Streets, 7-9 AM;
Fell Street, south side, Franklin to Market Streets, 7-9 AM;
Gough Street, east side, Fell to Page Streets, 7-9 AM;
Hayes Street, north side, Larkin to Polk Street, 7-9 AM;
Hayes Street, both sides, Franklin to Market Streets, 7-9 AM;
6th Street, east side, Bryant to Market Streets, 4-7 PM;
6th Street, east side, Brannan to Bryant Streets, 4-7 PM;
9th Street, east side, Harrison to Howard Streets, 4-7 PM;
9th Street, both sides, Howard to Market Streets, 4-7 PM;
10th Street, east side, Bryant to Howard Streets, 4-6 PM;
10th Street, east side, Mission to Howard Streets, -4-6 PM;
Hayes Street, north side, Larkin to Polk Streets, 4-7 PM;
Hayes Street, both sides, Market to Franklin Streets, 4-7 PM; and
Gough Street, east side. Fell to Page Streets, 4-6 PM.

4.2 Proposed TSM measures

1. Install Detectors in Left-Turn Lanes on Van Ness Avenue

Traffic waiting to make left turns from the existing short left turn pockets along Van Ness Avenue frequently overflows the pockets and blocks the left through lane of Van Ness Avenue. This project would install traffic detectors in these left turn pockets which would detect when the left turn pocket is full and provide a slightly longer left turn arrow phase at these times.

2. Improved U-Turn at South Van Ness Avenue/Mission Street/Otis Street Intersection

The existing U-Turn from eastbound Mission Street onto westbound Otis Street is very sharp, bumpy and controlled by a traffic signal. This project would improve this turn by acquiring part of the triangular shaped property west of South Van Ness Avenue between Mission and Otis Streets and allowing the U-turn to be made west of the South Van Ness Avenue/Mission Street/Otis Street intersection. Motorists could use this route and turn right from westbound Otis Street onto northbound Gough Street (or Brady Street), then right onto Market Street and left onto Franklin Street.

3. Interconnect the Traffic Signals in the Central Freeway Traffic Signal Subsystem

A temporary special traffic signal sub-system was installed along the main Central Freeway detour routes (9th, 10th, Oak, Fell and Hayes Streets) using a 90 second traffic signal cycle. This traffic signal subsystem was temporarily disconnected from the adjacent traffic signal systems and synchronized through time-based coordination. If the Central Freeway is not replaced, this subsystem could either be made permanent or the cycle lengths of this subsystem and the adjacent traffic signal system could be increased or decreased to a common cycle length of perhaps 80 seconds. In order to maintain the existing Central Freeway detour route 90 second cycle length without changing the cycle length of the existing adjacent systems, a significant amount of hard wire interconnect is recommended.

4. Provide a Left Turn Phase for Southbound South Van Ness Avenue at Mission Street

Providing a left turn signal phase and left turn arrow at this intersection would reduce delays for Municipal Railway buses on routes 42 and 47 which must make this left turn against heavy volumes of opposing traffic. The left turn phase would only be actuated when a bus is detected in this left turn pocket, which is signed and striped for buses only.

An alternative to this project is to signalize the South Van Ness Avenue/12th Street Intersection. Signalizing this intersection would provide a gap in northbound traffic on South Van Ness Avenue so that traffic on southbound South Van Ness Avenue could turn left onto 12th Street more easily. It would also reduce the difficulty of left turns from southbound South Van Ness Avenue onto eastbound Mission Street by Muni vehicles. This signal would allow for the metering of northbound traffic on South Van Ness Avenue so that it does not spill back from the Market/Van Ness intersection into the South Van Ness Avenue/Mission Street intersection and block westbound traffic on Mission Street.

5. Widen East Side of South Van Ness Avenue Between Mission and Market Streets

While the east sidewalk of South Van Ness Avenue is very wide (about 22 feet), the curb lane is only about nine feet wide. An increase in the width of the northbound curb lane from nine to eleven feet would allow this lane to function as a transit and right-turn only lane, speeding service for the three Muni lines operating on this congested block. Additionally, traffic conflicts at the intersection of southbound South Van Ness Avenue with Mission, Otis and 12th Streets could be reduced by realigning the 12th Street leg so that it intersects South Van Ness Avenue in a T intersection just north of Otis Street.

6. Signalize and Provide Dual Right Turn Lane on Eastbound 13th Street at South

Van Ness Avenue

This project would improve access to the South Van Ness Avenue loop on-ramp to the Central Freeway and would minimize queuing onto Otis and Mission Streets along eastbound 13th Street. Signalizing the right turn would minimize interference between traffic approaching the loop on-ramp from 13th Street and traffic approaching it from southbound South Van Ness Avenue.

7. Provide Pedestrian Traffic Signals on Oak Fell, Hayes and Grove Streets Between Van Ness Avenue and Octavia Street

Pedestrian "walk/dont walk" signals would improve safety for pedestrians in this impacted area.

8. Additional Traffic Signage

While the large volume of new signs provided by Caltrans on city streets as part of the initial TMP effort proved very beneficial, existing signage will be improved through the placement of additional signs along underutilized detour routes, depending upon the alternative selected.

5.0 AFFECTED ENVIRONMENT, IMPACTS AND MITIGATION

5.1 Environmental Setting

Topography and Drainage

The project site is located within an urban setting in the northeast quadrant of the City of San Francisco. Existing ground elevation along the proposed alignments rises from approximately 9.14 meters (30') above sea level in the vicinity of Mission Street to approximately 27.43 meters (90') at Haight Street. The elevation declines to 19.81 meters (65') to 21.36 meters (70') between Oak and Fell Streets.

Climate and Vegetation

The climate is Mediterranean with warm summers and moderate cool winters. The annual temperature ranges from 1.1-26.6 degrees Celsius (30-80 Farenheit), with the annual mean about 13.8 degrees Celsius (57 Farenheit). The annual rainfall is approximately 50.80 cm (20''); the rainy season extends from November to March. Vegetation consists of street trees and highway plantings.

Site Geology and Groundwater

The northwesterly trending ridge including Lone Mountain and Hayes Street Hill, located southwest of the project is a bedrock "island" surrounded by alluvial and aeolian (dune) deposits and artificial fill.

The proposed project passes through Quaternary alluvium and dune sand deposits overlying bedrock consisting of the Jurassic-Cretaceous Franciscan formation and associated serpentine. The Franciscan formation in the project area consists of intensely sheared, fine to coarse grained sandstone and shale. Both the sandstone and shale tend to become harder and stronger with depth. The Franciscan formation underlies the entire project at depth with the rock surface dipping northeasterly towards the north end of the project. The total thickness of this formation is not known.

Groundwater has been encountered at depths ranging from of approximately 3.0 meters (10′) to 9 meters (30′) below ground surface.

Regional Geology

The project is located in the northern portion of the San Francisco peninsula which separates San Francisco Bay from the Pacific Ocean. The Santa Cruz Mountain range forms the backbone of the peninsula. The peninsula is within the California Coast Ranges geomorphic province, characterized by generally northwest trending mountain ranges and intermontane valleys.

San Francisco Bay is a partially flooded, northwesterly trending structural depression, extending from Santa Clara Valley in the south to Petaluma Valley in the north. San Francisco is geologically a very recent feature, formed largely by subsidence associated with vertical faulting and downwarping during the Late Pliocene or Early Pleistocene.

Since its formation, natural geologic processes have been working to fill in the bay. Fine grained suspended particles are deposited in still waters within the bay to form thick layers of soft muds, while streams from the surrounding hills deposit coarser grained sediments adjacent to the hills, becoming progressively finer and less consolidated closer to and in the bay.

5.2 Seismicity

The project site is located in an area of high seismic activity with eight major active faults located in the San Francisco Bay Area. The Loma Prieta earthquake of October 17, 1989 was the most recent major seismic event in the Bay Area. It was generated in the San Andreas fault with a magnitude of 7.0 on the Richter scale. Soil liquefaction occurred over a widespread area. The Marina District which is located 3.2 km (2 miles) northeast of the project area experienced major liquefaction damages.

The two major critical faults with respect to this project are the San Andreas fault, 12.9 km (8 miles) to the west, and the Hayward fault, 17.7 km (11 miles) to the east. Events on these two fault were considered in the seismic analysis; the San

Andreas fault producing a maximum credible earthquake (MCE) of 8 and the Hayward fault, producing a MCE of 7.5. MCE expresses the largest earthquake that appears reasonably capable of occurring under the presently known geological framework. There events are expected to generate peak bedrock accelerations of 0.40g and 0.29g, respectively.

Although located in an area of high seismic activity, there are no significant unmitigable geotechnical conditions for any of the proposed alternatives. Geotechnical constraints such as liquifaction and compressible soils must be considered in the engineering design and construction of the project. These constraints may be mitigated by the use of deep pile foundations, such as cast-in-drilled-hole piles and/or driven piles. The use of those methods would bypass the weak soil layers into firm stable strata. Pile driving and dewatering operations must be monitored during construction to minimize ground settlement. Appropriate construction mitigation measures will be pursued to address this potential impact. Further geotechnical and materials studies will be performed during the design phase of this project.

5.3 Air Quality

Air pollution throughout urban areas in the United States and in the Bay Area has been determined to be a serious health risk by the Environmental Protection Agency (EPA), the California Air Resources Board (CARB) and the Bay Area Air Quality Management District (BAAQMD). A major source of airborne pollution is caused by motor vehicles and therefore the state and federal law require transportation project sponsors to determine if the project will cause a violation of state or federal air quality standards.

The Federal Clean Air Act requires a local or microscale analysis for nearby receptors along those freeways and local intersections potentially affected by a project. In the San Francisco Bay Region, carbon monoxide (CO) is the criteria air pollutant of concern for microscale analysis. In the human body, CO can restrict the blood's ability to transport oxygen, posing a threat for people suffering from respiratory problems and heart disease. It can also cause headaches, fatigue and slow the reflexes , even among healthy people.

To assess local air quality impacts , CALINE 4, a computerized dispersion model was used. This model takes into account factors such as wind speed, wind direction, atmospheric stability class, temperature, traffic volumes and speeds and motor vehicle emissions. Traffic data for the air quality analysis were developed by the City of San Francisco and Caltrans and represent peak hour traffic conditions at intersections for each of the alternatives.

The Clean Air Act requires that project impacts be analyzed for the year of project opening and a year in the future, in this case 2015. Because studies indicate that present day traffic (1997) is at maximum congestion levels during peak hours, it will not change substantially in the future. Background CO levels and vehicle emissions will continue to decline, resulting in lower CO levels by the year 2015. For these reasons, no further analysis of the year 2015 is provided. The estimated completion of this project and date used as the basis for analysis is the year 2000.

Project Related Impacts

None of the alternatives will have regional impacts on air quality since there are no capacity increasing improvements associated with the proposed project.

With respect to microscale air quality, the projected worst case 1-hour and 8-hour CO levels at receptors within the project area were analyzed. The total CO concentrations figure represents the total of predicted roadway and background levels. None of the project alternatives will exceed federal or state CO standards for parts per million (PPM) concentrations, these standards are provided below:

CO Standards	**1-hour concentration parts-per-million**	**8-hour concentration parts-per-million**
State	20 ppm	9 ppm
Federal	35 ppm	9 ppm

Alternatives 1A and 1B

These two alternatives will reduce traffic congestion at 23 of 27 intersections compared to the No-Project condition, thereby reducing emissions. The Oak/Laguna, Oak/Octavia, Duboce/Guerrero and Fell/Laguna intersection will experience increased congestion. The Fell/ Laguna intersection represents the worst case condition for this alternative resulting in a 1-hour concentration of 14.6 ppm and an 8-hour concentrations of 9.0 ppm. These concentrations are well below the 1-hour standards and meets the 8-hour standard.

Alternative 8B

Alternative 8B will reduce congestion at 18 intersections and increase congestion at 9 intersections. The worst case intersection occurs at Market/Octavia Streets with a 1-hour concentration of 13.3 ppm and an 8-hour concentration of 8.6 ppm; these values are below the state and federal standards.

Alternative 10

Alternative 10 will provide very little congestion relief at the intersections studied, when compared to the No-Project Alternative. The worst case intersection being Duboce/Mission with 1-hour concentrations of 13.4 ppm and an 8-hour concentration of 7.7 ppm. As with the other alternatives, even the worst case intersection is below the standards.

Construction Impacts

Implementation of any of the alternatives will generate temporary increases in pollutant concentrations during the construction process. Measures will be included in the construction contract to minimize the dispersion of fugitive dust caused by demolition, excavation, hauling and various other activities. All construction equipment will be required to be a good state of repair to minimize emissions.

Since this project will not have an adverse effect on regional or local air quality, no mitigation measures are proposed.

5.4 Noise

To assess the noise impacts of the project alternatives, noise measurements were taken during peak evening hour (from 2 p.m. to 6 p.m.). These noise levels represent outside noise levels only and include freeway and local street traffic noise as well as other ambient local noise sources. Noise levels were calculated using the SOUND 32
omputer program (Caltrans version of STAMINA2/OPTIMA). An explanation of the relative noise levels presented in this discussion is included in Exhibit 9, Typical Noise Source Levels.

Background exterior noise levels are predicted to range from 50-70 dBA for Alternative 1A and 1B and from 50-73 dBA for Alternative 8B at typical sites along the facility from Mission to Fell Streets. The background traffic noise for the no-project alternative is predicted to range from 47-69 dBA.

Since most of the locations do not have exterior use areas such as decks or gardens, inside noise criteria levels are appropriate when considering project impacts and the need for barrier protection. Interior noise levels were predicted to range from 40-60 dBA for alternatives 1A and 1B and 40-63 for Alternative 8B. These predicted levels assume that a building with an open window provides a minimum 10 dBA reduction. Table 1 summaries the expected future noise levels for alternatives 1A, 1B, 8B and the No Project Alternative.

Predicted noise levels constitute substantial increases over the No Project Alternative, according to criteria established in the Caltrans Project Development and Procedures Manual, for receptor site R-3a located at 275-277 Oak Street under Alternative 8B. When Alternative 8B is compared to the No Project Alternative, there would be a resulting increase of 18 dBA. According to the criteria this is a substantial increase.

For Alternative 8B, residential receptors along the east side of Elgin Park between Duboce and McCoppin have exterior uses. Predicted noise levels at two of the three sites investigated approach the Federal Highway Administration's, Noise Abatement Criteria (NAC) and would qualify for barrier protection. At these

COMMON OUTDOOR NOISE LEVELS	NOISE LEVEL (dba)	COMMON INDOOR NOISE LEVELS
	110	Rock Band
Jet Flyover at 1000 ft		
	100	Inside Subway Train (New York)
Gas Lawn Mower at 3 ft		
	90	Food Blender at 3 ft
Diesel Truck at 50 ft		
Noisy Urban Daytime	80	Garbage Disposal at 3 ft Shouting at 3 ft
Gas Lawn Mower at 100 ft	70	Vacuum Cleaner at 10 ft
Commercial Area		Normal Speech at 3 ft
Heavy Traffic at 300 ft	60	Large Business Office
Quiet Urban Daytime	50	Dishwasher Next Room
Quiet Urban Nighttime	40	Small Theatre, Large Conference Room (Background)
Quiet Suburban Nighttime		Library
	30	Bedroom At Night Concert Hall (Background)
Quiet Rural Nighttime		
	20	Broadcast and Recording Studio
	10	
	0	Threshold Of Hearing

Central Freeway Replacement Project

Caltrans

Typical Noise Source Levels

Exhibit 9

Table 1

ALTERNATIVES 1A, 1B, 8B AND NO PROJECT ALTERNATIVE
PREDICTED
FUTURE PEAK HOUR dBA (LEQ(H)
UNMITIGATED CONDITION

Receptor	Location	Alt. 1A/1B Unmitigated* dBA (leqH)	Alt. 8B Unmitigated* dBA (leqH)	No Project Unmitigated* dBA (leqH)
R-1	parking lot[1]	63	66	59
R-1A	331 Octavia #6[1]	63	65	59
R-1B	331 Octavia #10[2]	64	65	60
R-1C	331 Octavia #18[3]	65	64	62
R-2	209-217 Octavia[1]	63	68	58
R-3A	275 & 277 Oak[1]	63	73	55
R-3B	275 & 277 Oak[2]	63	71	56
R-4	273 & 287 Page[1]	50	50	47
R-4A	200 Rose #6[2]	58	59	52
R-4B	200 Rose #12[3]	58	59	52
R-5A	100 Haight[1]	60	63	54
R-5B	102 Haight[2]	60	63	55
R-5C	103 Haight[3]	60	63	55
R-6A	21 Octavia[1]	59	67	54
R-6B	21 Octavia[5]	70	67	66
R-7	119 Haight[1]	59	56	51
R-7A	59 Octavia[1]	63	67	59
R-7B	57 Octavia[2]	66	67	60
R-7C	55 Octavia[3]	68	67	61
R-8A	16 Valencia #1[2]	60	72	60
R-8B	16 Valencia #21[3]	61	72	64
R-8C	16 Valencia #41[4]	63	72	69
R-9	150 Valencia[1]	56	59	56
R-10A	1330A Stevenson[1]	60	62	62
R-10B	1352A Stevenson[2]	62	66	66
R-10C	1354A Stevenson[3]	66	71	68
R-11A	1369 Stevenson[1]	60	62	63
R-11B	1369A Stevenson[2]	63	66	66

1-Ground level
2-Second Floor
3-Third Floor
4-Fourth Floor
5-Roof Level

* Freeway traffic generated noise only (worst case)

locations, a 3.65 meter (12') high soundwall on the freeway, approximately 60.96 meters (200') long would provide noise attenuation of 6-7 dBA. However, due to the potential visual impacts, the limited nature of outside uses and previous public comments preferring fewer rather than more structures in the area, a sound wall is not currently recommended. The public comment period should serve to elicit the opinions of affected residents and other concerned parties regarding the advisability of a sound wall at this location. Table 2 shows predicted future noise levels with and without mitigation.

Table 2

ALTERNATIVE 8B - ELGIN PARK
SUMMARY OF PREDICTED NOISE LEVELS
FUTURE PEAK HOUR (LEQ (H))

Receptor	Alt. 8B Unmitigated*	Alt. 8B Mitigated* 12 ft. barrier
EP-1A	61	58
EP-1B	64	60
EP-2A	62	59
EP-2B	65	58
EP-3A	62	59
EP-3B	67	60

* Freeway traffic generated noise only (worst case)

The predicted noise levels will vary considerably in the Alternative 8B touch down area depending on the exact height of the freeway facility. When the final vertical alignment of the structure is established, the dimensions of a proposed sound wall
should be reviewed. It should be noted that soundwalls can only be provided if they meet Caltrans cost-effectiveness guidelines.

Residences along Octavia Street between Page and Fell Street qualify for consideration of noise attenuation. A noise barrier on the right-of-way line or edge of sidewalk adjacent to Octavia Street would be acoustically effective at several locations.

For reasons similar to those stated for regarding soundwalls in the vicinity of Elgin Park, a soundwall is not currently recommended. The public comment period should serve to elicit the opinions of affected residents and other concerned parties regarding the advisability of constructing sound walls at this location. Table 3 shows the predicted mitigated and unmitigated conditions in this location for Alternative 8B.

The predicted decibel levels vary considerably in this area according to the exact height of the freeway facility. Since the exact height is likely to change during the design process, this area should be studied in the final design phase. There may very well be more residential receptors not investigated in this study which will qualify for barrier protection and benefit substantially from a noise wall. A cost-effectiveness study will also be needed at this location.

Table 3

ALTERNATIVE 8B - OCTAVIA ST. (EAST)
SUMMARY OF PREDICTED NOISE LEVELS
FUTURE PEAK HOUR dBA (LEQ(H))

Receptor	Location	Alt. 8B Unmitigated *	Alt. 8B R/W Wall 12 ft.*	Alt 8B R/W Wall 16 ft.*	Alt. 8B HP Wall 114 ft.*	No Project Unmitigated *
			dBA	dBA	dBA	dBA
O-1	Haight St.	69	67	67	66	59
O-2a	Haight St.	70	68	68	66	59
O-2b	Haight St.	70	70	70	68	60
O-3a	Rose-Page	69	69	69	61	62
O-3b	Rose-Page	69	69	69	63	58
O-4a	Rose-Page	69	69	69	62	55
O-4b	Rose-Page	70	69	69	63	56
O-5a	Rose-Page	69	69	69	65	47
O-5b	Rose-Page	69	69	69	65	52
O-6a	Page	71	65	65	66	52
O-6b	Page	70	66	66	66	54
O-7a	Page-Lily	71	55	55	58	55
O-7b	Page-Lily	71	64	60	62	55
O-8	Lily	71	58	55	57	54
O-9a	Lily-Oak	76	76	76	76	66
O-9b	Lily-Oak	74	74	74	74	51
O-10	Oak-Hickory	70	64	61	66	59
O-11a	Hickory-Fell	67	63	60	58	60
O-11b	Hickory-Fell	67	67	67	65	61

* Freeway traffic generated noise only (worst case)

For any of the locations at which noise walls are warranted and meet cost effectiveness criteria, there would be community meetings to determine if they would be acceptable to the public.

No noise measurements were taken for Alternative 10. In the absence of a freeway structure, this alternative would have the effect of dispersing traffic on local streets. It is not anticipated that there will be substantial noise increases resulting from that alternative.

5.5 Visual Resources

In the immediate project area, the freeway structure is the dominate feature visual element of this urban landscape. Landcover is typified by urban features such as multi-story buildings of varied architectural styles, city streets and parking lots. Landscaping is limited to street trees and informal highway planting adjacent to the highway structure.

In assessing visual impacts, the perspectives of residents, pedestrians, businesses, surface and freeway motorists were considered. Viewpoints for this analysis include Market Street, Valencia Street, Octavia Street and the proposed facilities. The visual impacts for each of these alternatives are discussed below.

Alternative 1A and 1B

When compared to the existing structure, the new structure at 23.77 meters (80') would be more than twice as wide as the existing 2-lane structure. Although within existing right-of-way, the facility in some cases would be closer to or further away from adjacent buildings. In the case of Alternative 1A, the structure would be taller than the existing 2-lane deck configuration.

For residents, businesses, pedestrians and motorists on city streets adjacent to or beneath the structure, the most noticeable and potentially negative visual changes would result from the increased shadow area due to the added width of the new structure. Some nearby buildings would also be affected by this increase in shadow

area. Viewers on city streets may be affected by the added structural width obstructing distant views of the city skyline.

Highway motorists on the new approach would experience minor visual changes. Motorists' views would be brought closer to the existing buildings along Elgin Park, McCoppin, Market, Oak and Octavia Streets. Many of these buildings are taller than the structure proposed under these alternatives, but view obstruction across the city skyline for motorists is expected to be temporary and intermittent.

The overall visual quality of this area will not be greatly altered with the construction of either of these alternatives. The degree of change in visual quality would be minimal for most viewers.

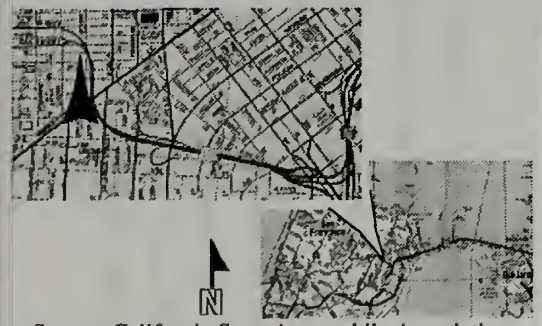
For these alternatives, architectural aesthetic treatments to the Central Freeway approach structures would help reduce the visual impact and distinction of the structure within the foreground viewing range of a business or residence.

Foreground and mid-range viewers of the freeway approach structures could have the degree of visual impact minimized or reduced by the use of landscape planting. Plantings of this type will help screen and soften the architecture of the structures. Landscape replacement would follow major construction as a separate contract item.

Exhibit 10 shows a visual simulation of Alternatives 1A and 1B

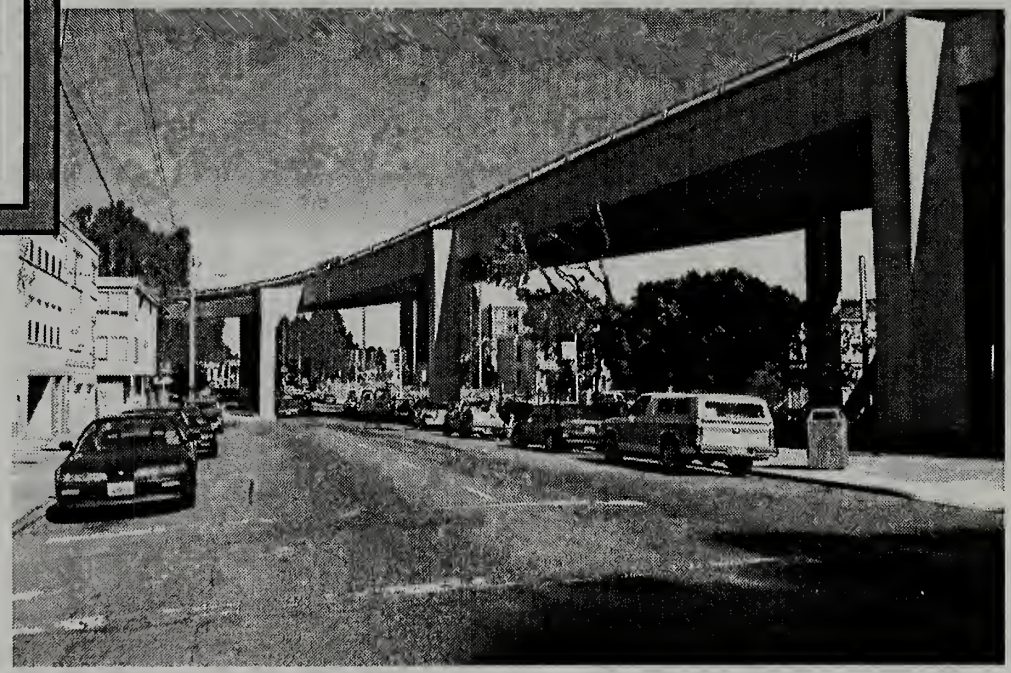
Existing Conditions

On Octavia Street at Lily Street, looking north.



Source: California State Automobile Association

Photo Location Map



Simulation of Proposed Project

View of the proposed new elevated structure.

Central Freeway Replacement Project Caltrans	Visual Simulation Alternatives 1A and 1B	Exhibit 10

Alternative 8B

This alternative has substantially different visual effects from alternatives 1A and 1 B. There would be a range of visual responses as a result of this alternative.

Residents and businesses between Mission and Market Streets would experience some negative visual impacts as a result of a wider freeway structure. This alternative would bring the structure closer to buildings along the alignment, particularly along the western edge. The increased width of the structure will also result in additional shade and shadow for those adjacent to the structure.

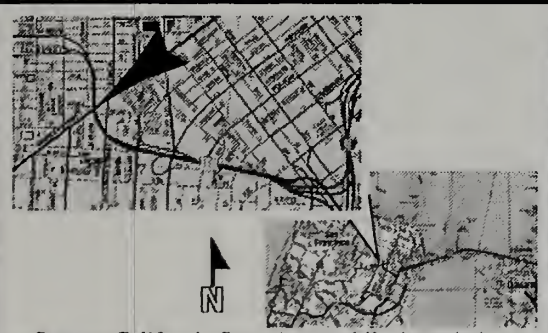
The proposed structure elevation would be lower than currently exists in order to meet Market Street at grade. In the immediate vicinity of Valencia, Market, McCoppin Streets and Elgin Park the response by residents and business to these visual changes will be both positive and negative. While some residents and business would visually benefit by the elevation reduction of the structure; others in multi-story buildings in close proximity to the alignment, might respond negatively because of being exposed to open views of the 4-lane freeway structure.

For pedestrians, residents and motorists traveling east and west on Market Street, views would no longer be restricted by the overhead freeway structure that currently spans Market Street. This would be a positive visual impact, creating a new east-west view. Existing shade and shadow patterns now experienced by businesses and pedestrians and nearby residents would be eliminated by removal of the structure.

Residents and other viewers between Market and Fell Street adjacent to the freeway right-of-way along Octavia Street would experience positive visual impacts with the removal of the existing elevated freeway structure. Existing shade and shadow patterns would be eliminated. Views would open up across the city skyline that are currently blocked by the existing structure. Viewers in the immediate area would see a new, 4-lane at grade street in addition to the existing two travel lanes on Octavia Street. The visual change that would occur under this alternative would be both positive and substantial. Exhibits 11 and 12 show visual simulations of Alternative 8B.

Existing Conditions

On Market Street near Valencia, looking southwest.



Source: California State Automobile Association

Photo Location Map

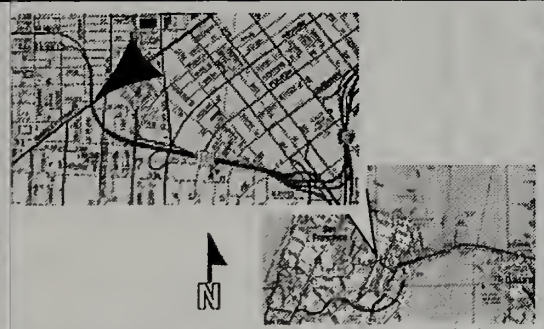
Simulation of Proposed Project

View of proposed new Market Street on and off-ramp with the overhead structure removed.

Central Freeway Replacement Project Caltrans	Visual Simulation Alternative 8B	Exhibit 11

Existing Conditions

On Market Street near Octavia, looking southwest.



Source: California State Automobile Association

Photo Location Map

Simulation of Proposed Project

View of proposed new Market Street on and off-ramp with the overhead structure removed.

Central Freeway Replacement Project Caltrans	Visual Simulation Alternative 8B	Exhibit 12

In general, viewers on city streets north of Market Street would be positively affected by the creation of foreground, mid-range and distant views of the city and surrounding skyline.

Freeway motorists on the new approach structure would also experience visual changes. Motorists' views would be brought closer to buildings along Elgin Park, McCoppin and Market Streets. Motorists' exiting the freeway on the new Market Street ramp would experience city street views while descending the ramp onto Market Street. At the lower elevation nearby buildings would obstruct views of the city skyline, this obstruction would be of brief duration and intermittent, with new views created by the removal of the existing structure.

Measures to reduce visual impact would be the same as described above for alternatives 1A and 1B.

Alternative 10

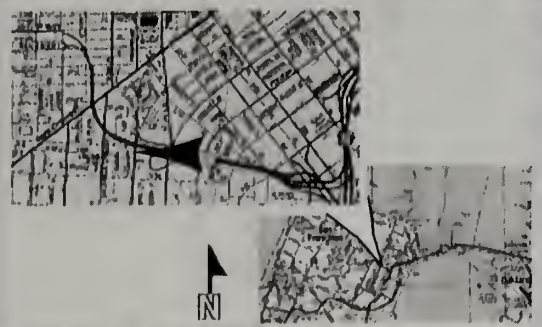
The existing freeway structure is a visually encroaching element in foreground and mid-range views for residents, businesses, pedestrians and surface street motorists. Removing the existing structure from Mission Street to Fell Street would open up new vistas west of Mission Street, north to Fell Street.

With the structure removed, the immediate area would appear brighter and more open and shadows cast by the existing structure would be eliminated. There would be no net change in visual quality for freeway motorists. New close, mid-range and distant views would open up within the project area for all viewers All visual impacts resulting from this alternative would be visually positive.

No mitigation measures are proposed for this alternative. Exhibit 13 shows a visual simulation of Alternative 10

Existing Conditions

On Duboce Avenue at Otis, looking westbound.



Source: California State Automobile Association

Photo Location Map

Simulation of Proposed Project

View of the proposed removal of the overhead structure west of the Mission Street exit.

Central Freeway Replacement Project Caltrans	Visual Simulation Alternative 10	Exhibit 13

No Project Alternative

Although the structure would be retrofitted under this alternative, the visual changes of the seismic improvements would be insignificant. The project would strengthen existing columns supporting the structure. The height of the structure would not change, nor would there be any new elements to block or screen visual sight lines.

No mitigation measures are proposed for this alternative.

5.6 Traffic and Circulation

The proposed project alternatives will have an effect on traffic and circulation on selected streets and intersections along the routes leading to the freeway. The study area extended from the Interstate 80/101 interchange to the Oak and Fell Street termini. Exhibit 14 shows the Central Freeway Traffic Study Area.

The analysis was performed using current traffic demands. Traffic demand into the city and within the city is already at or exceeds capacity, for this reason it was assumed that traffic forecasts for future years would essentially reflect existing conditions. Demand was measured prior to the demolition of the upper deck and is used in the analysis. The changes in surface street patterns were measured after the Central Freeway was closed and is also included in this analysis. The TMP improvements implemented during the demolition of the upper deck were also considered in this analysis.

Traffic Conditions without the Central Freeway

The 1995 Annual Average Daily Traffic (AADT) for the Central Freeway between the junction of Interstate 80 and the Mission Street ramp was 138,000 vehicles. The AADT represents the total volume in both directions.

Central Freeway Replacement Project

Caltrans

Traffic Study Area

Exhibit 14

Without the Central Freeway section between Mission and Fell Streets, the northbound Central Freeway between the I-80 junction and the Mission Street off-ramp operates free flow during the morning peak period. The peak travel for the northbound Central freeway is in the afternoon. Congestion on the freeway is mainly caused by the congestion on Duboce Avenue. The queue from the Market Street, Duboce Avenue intersection extends beyond Mission Street and affects the off-ramp traffic. The congestion continues on the off-ramp and the Central Freeway back to the I-80 junction.

The peak travel time for the southbound Central freeway is in the morning. Congestion on the freeway is mainly caused by the limited capacity at the branch connection to Southbound U.S. 101. The congestion is stored on the freeway, the South Van Ness on-ramp, 13th Street and Otis Street as far as McCoppin Street.

Based on these conditions, maximum travel time and maximum delay along the specified routes are listed in Tables 4 and 5 It should be noted that outbound refers to traffic exiting the city, while inbound traffic refers to traffic entering the city.

Table 4
Street Travel Times & Delays
Without Central Freeway (btw. Mission and Fell Streets)

Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
Outbound 8 - 9 AM	Oak/Laguna I/S to Franklin, Fell, 10th, Bryant, 8th St. on-ramp	8.3	4.4
	Oak/Gough I/S to Otis, 13th, So. Van Ness on-ramp	4.0	1.5
Outbound 5 - 6 PM	Oak/Gough I/S to Otis, 13th, So. Van Ness on-ramp	6.3	3.8
	Oak, Laguna I/S to Franklin, Fell, 10th, Bryant, 8th St. on-ramp	4.4	0.5
Inbound 8 - 9 AM	Mission,Off-ramp I/S along Duboce Ave to Market St., Duboce Ave. I/S	3.0	1.5
	8th,Harrison I,S to 9th, Hayes, Gough, Fell, Laguna,Fell St I/S	4.9	1.7
Inbound 5 - 6 PM	Mission,Off-ramp I/S along Duboce Ave to Market St.,Duboce Ave. I/S	6.2	4.7
	9th,Bryant I,S to Hayes, Gough, Fell, to Laguna, Fell I/S	10.3	7.1

Table 5
Freeway Travel Times & Delays
Without Central Freeway (btw. Mission and Fell Streets)

Direction & Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
Outbound 8 - 9 AM	So. Van Ness on-ramp to I-80 branch connection	2.6	1.6
Outbound 5 - 6 PM	So. Van Ness on-ramp to I-80 branch connection	1.9	0.9
Inbound 8 - 9 AM	I-80 junction to Mission St. off-ramp	1.7	0.5
Inbound 5 - 6 PM	I-80 junction to Mission St. off-ramp	3.5	2.6

The capacity and Level of Service (LOS) of local street intersections under the conditions with the Central Freeway section between Mission and Fell Streets were analyzed. The quality of traffic service provided by a roadway system depends on the relationship between traffic volumes and the capacity of the system. The LOS concept is a standardized means of classifying traffic conditions at intersections or on a freeway. There are six LOS, A through F, which are related to peak-period traffic conditions from best (A) to worst (F).

The LOS were analyzed for the intersections shown below. Traffic volumes were counted between October, 1996 and January, 1997. A capacity analysis of each intersection in the A.M. and P.M. peak was performed and lane configurations were surveyed in the field. The results of the intersection capacity analysis are summarized in Table 6.

Table 6
Central Freeway Replacement Project
Level Of Service
Without Central Freeway (Btw. Mission and Fell Streets)

#	Intersection	A.M. Peak	P.M. Peak
1	8th St.,Harrison St.	D	F
2	9th St.,Harrison St.	D	F
3	9th St.,Mission St.	D	E
4	9th St.,Market St,Larkin St.	E	F
5	Fell St.,Gough St.	F	F
6	Fell St.,Laguna St.	C	C
7	Oak St.,Laguna St.	F	D
8	Oak St.,Octavia St	F	F
9	Oak St.,Gough St.	F	F
10	Oak St.,Franklin St	F	F
11	Fell St.,Franklin St.	F	F
12	Fell St.,Van Ness Ave	E	E
13	Fell St.,Market St.,Polk St.,10th St.	E	E
14	10th St.,Mission St.	E	D
15	10th St.,Howard St.	E	D
16	10th St.,Folsom St.	E	E
17	10th St.,Harrison St.	E	E
18	10th St.,Bryant St.	E	F
19	9th St.,Bryant St.	E	F
20	8th St.,Bryant St.	E	F
21	Page St.,Gough St.	F	F
22	Market St.,Gough St.,Haight St.	E	E
23	Market St,,McCoppin St,Octavia St.	D	E
24	Duboce Ave,Guerrero St.	D	F
25	Duboce Ave,Valencia St.	D	F
26	Duboce Ave,Otis St.,13th St.	F	F
27	Gough St,Otis St.,McCoppin St.	F	E
28	13th St.,South Van Ness Ave	F	E

During the morning outbound commute without the Central Freeway segment, the controlling bottleneck along the Oak, Franklin, Fell, 10th Street route to the 10th Street on ramp is the Van Ness Avenue, Fell Street intersection. Congestion is stored on Fell, Franklin, and Oak Street to Laguna Street. The controlling bottleneck along the Oak, Gough, Otis and 13th Street route to the South Van Ness on-ramp is the Market and Gough Street intersection. Congestion is stored on Gough Street between Market and Oak Streets. No measurable congestion or delay is being experienced by inbound traffic during this period.

During the afternoon outbound commute, the controlling bottleneck along the Oak, Gough, Otis and 13th Streets route to the South Van Ness on-ramp occurs at the Market and Gough Streets intersection. Congestion also occurs at the Otis Street and Duboce Avenue intersection, Bryant between 8th and 10th Street and the 10th Street on ramp. This congestion is caused by capacity problems on the local streets, in the case of the Bryant Street the 8th Street on-ramp is the cause of the congestion.

For inbound traffic during this period congestion occurs along Duboce Avenue beginning at the Mission Street off-ramp and continues to the Duboce and Market Street intersection. Congesion also occurs at the 5th Street off-ramp, Gough, Hayes Streets and on 9th Street (between Harrison and Bryant Streets) and on Harrision to 8th Street.

Expected Conditions

The expected future traffic and circulation conditions were studied in order to compare the alternatives under consideration. This study does not reflect the freeway operation along westbound I-80 between the Bay Bridge and the U.S. 101, I-280 junction. However, the expected operation of traffic for the 8th Street off-ramp from westbound I-80 and the 9th Street off-ramp from the I-80, U.S. 101 junction and their expected street routes within the study limits are discussed.

Due to capacity constraints of the surface intersections, there will be excess demand outside of the project limits that will not reach the project area during the peak hour under alternatives 8B, 10 and for outbound traffic under the No-Project Alternative. Alternatives 1A and 1B can handle the demand that used the freeway

before demolition of the upper deck. Therefore for Alternative 8B and 10 there will be trips that will not be accommodated on the freeway. They will be diverted to some other route, corridor, time period, or not be made at all. It is not possible to analyze the impacts of this diversion without additional traffic data and extensive origin and destination studies.

TSM improvements if implemented would improve the operation of traffic for No-Build, Alternatives 8B and 10. For alternatives 1A and 1B no TSM improvements are proposed.

No Project Alternative

Table 7 summarizes the maximum travel time and delay in minutes caused by surface street bottlenecks for the No-Project Alternative.

Table 7
Outbound City Street Travel Times & Delays
No-Project Alternative

Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
8 - 9 AM	Oak,Laguna I/S to Franklin, Fell, 10th, Bryant, 8th St. on-ramp	8.3	4.4
	Oak,Gough I/S to Otis, 13th, So. Van Ness on-ramp	4.0	1.5
5 - 6 PM	Oak,Gough I/S to Otis, 13th, So. Van Ness on-ramp	6.3	3.8
	Oak,Laguna I/S to Franklin, Fell, 10th, Bryant, 8th St. on-ramp	4.4	0.5

Table 8 summarizes the travel time and delay time caused by freeway bottlenecks for the No Project Alternative.

Table 8
FREEWAY TRAVEL TIMES & DELAYS
No Project Alternative

Direction & Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
Outbound 8 - 9 AM	So. Van Ness on-ramp to I-80 branch connection	2.6	3.3
Outbound 5 - 6 PM	So. Van Ness on-ramp to I-80 branch connection	1.9	0.9
Inbound 8 - 9 AM	I-80 junction to Mission St. off-ramp	1.7	0.5
Inbound 5 - 6 PM	I-80 junction to Mission St. off-ramp	6.0	4.8

Alternative 1A & 1B

Under this alternative, most of the affected intersections will operate better than or equal to No-Project Alternative because the freeway will collect and distribute the traffic to the two major arterials (Oak and Fell Streets). Consequently, only these intersections will operate worse than the No Project Alternative:

- Fell, Laguna Streets AM and PM
- Oak Laguna Streets AM and PM
- Duboce Avenue,Guerrero Street AM only

The maximum travel times and delays for surface streets for Alternatives 1A and 1B are summarized in Table 9.

Table 9
Outbound City Street Travel Times & Delays
Alternatives 1A and 1B

Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
8 - 9 AM	Fell, Gough I/S to Laguna, to Oak St. on-ramp	3.5	2.5
5 - 6 PM	Fell, Gough I/S to Laguna, to Oak St. on-ramp	2.0	1.0

Table 10 summarizes the travel time and delay caused by freeway bottlenecks for Alternative 1A and 1B.

Table 10

FREEWAY TRAVEL TIMES & DELAYS
ALTERNATIVES 1A and 1B

Direction & Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
Outbound 8 - 9 AM	Oak St. on-ramp to I-80 branch connection	2.9	1.5
Outbound 5 - 6 PM	Oak St. on-ramp to I-80 branch connection	4.1	2.5
Inbound 8 - 9 AM	I-80 junction to Fell St. off-ramp	1.7	0.5
Inbound 5 - 6 PM	I-80 junction to Fell St. off-ramp	6.0	4.8

Alternative 8B

For this alternative, no left turn movements are assumed for either Market Street, Octavia Street, or the freeway off-ramp. The eastbound Market Street approach is expected to attract motorists because they will be able to enter the freeway ahead of the congestion on Octavia Street. Therefore, widening this approach from two lanes to three, by restricting the parking during peak-periods, will provide an additional lane for traffic to turn right at the on-ramp. This will leave the two through lanes for downtown
traffic and the overall operation of traffic will improve. The proposed Octavia Street approach will have steep grades and restricted sight distances. This will encourage low traffic speeds and the facility will have limited capacity.

The proximity of the South Van Ness on-ramp to the proposed Market street ramp will encourage the excess demand at Market Street to use the South Van Ness ramp. This analysis assumes that the South Van Ness on-ramp will remain as two lanes, the branch connection to southbound U.S. 101 will revert to pre-closure conditions, and that three lanes will be provided for eastbound Market Street between Guerrero Street and Octavia Street

Under these assumed conditions, it is anticipated that the following intersections will operate worse than No-Build:

- 9th, Harrison Streets AM and PM
- Fell, Laguna Streets AM
- Oak, Laguna Streets PM
- Oak, Octavia Streets AM and PM
- Market, Gough Streets. AM
- Market,Octavia Streets. AM and PM
- Duboce Ave, Guerrero Street AM
- Duboce Ave, Otis, 13th Streets AM and PM

Table 11 summarizes the maximum travel time and delays caused by surface street bottlenecks under Alternative 8B.

Table 11
Outbound City Street Travel Times & Delays
Alternatives 8b

Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
8 - 9 AM	Oak, Laguna I/S to Octavia, to Market St. on-ramp	4.0	3.0
8 - 9 AM	Oak, Laguna I/S to Gough, Otis, 13th, to So. Van Ness on-ramp	4.8	1.6

Table 12 summarizes the maximum travel time and delays caused by freeway bottlenecks under Alternative 8B.

Table 12
Freeway Travel Times & Delays
Alternatives 8B

Direction & Time	City street route	Travel Time (minutes)	Max. Delay (minutes)
Outbound 8 - 9 AM	Market St. on-ramp to I-80 branch connection	2.7	1.5
Outbound 5 - 6 PM	Market St. on-ramp to I-80 branch connection	3.9	2.5
Inbound 8 - 9 AM	I-80 junction to Market St. off-ramp	1.5	0.5
Inbound 5 - 6 PM	I-80 junction to Market St. off-ramp	5.8	4.8

Alternative 10 is operationally equivelant to the condition that exists today with the viaduct between Mission and Fell Streets closed to traffic. Traffic under Alternative 10 is expected to operate as described for surface streets conditions in the Existing Conditions section above. The proposed TSM measures would improve the operation of traffic under this alternative.

Should this alternative be selected, traffic operation is expected to continue as it does today. Currently, these intersections operate worse than the proposed no-project Alternative:

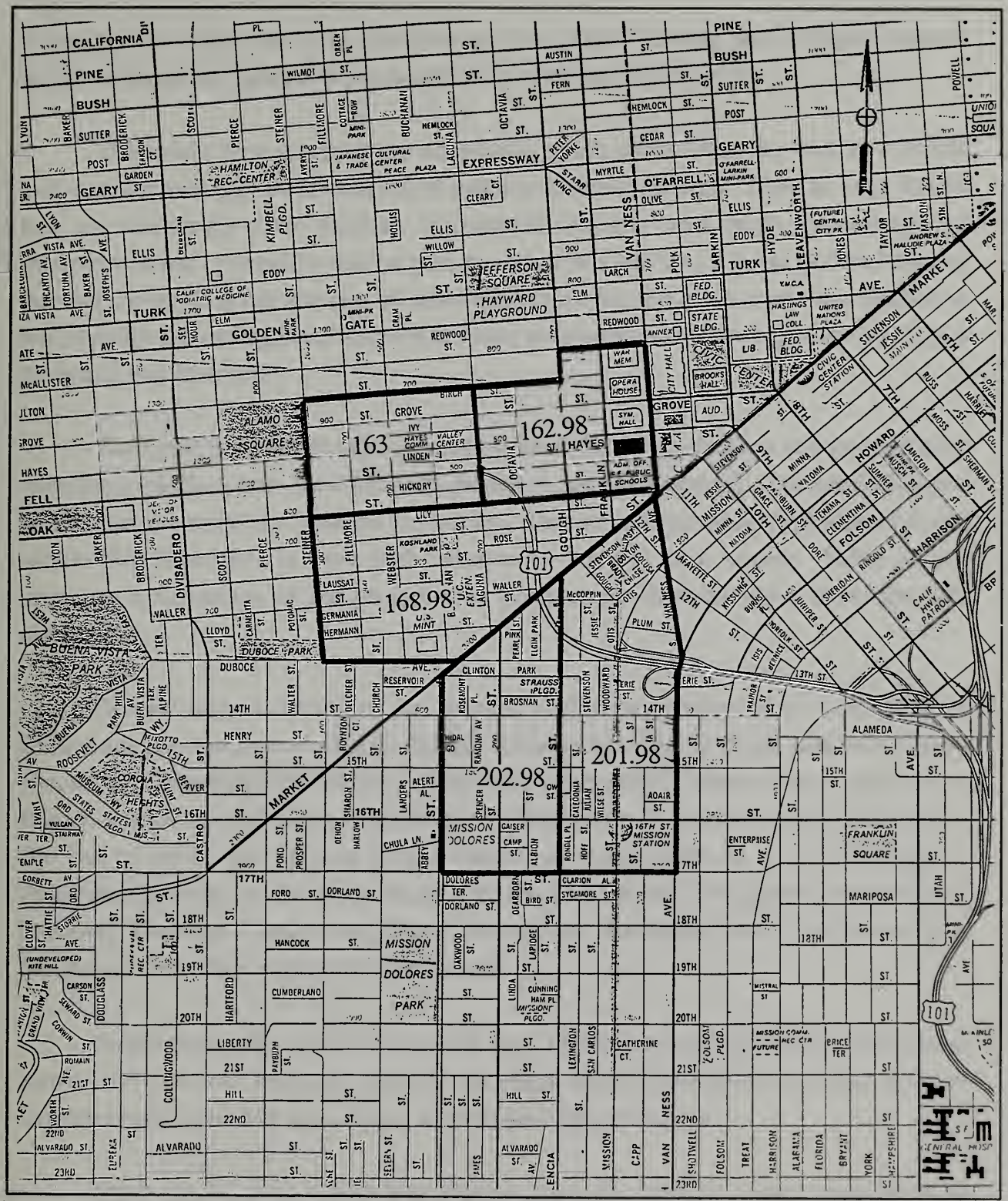
•	8th,Harrison Streets	AM and PM
•	9th,Harrison Streets	AM and PM
•	9th,Market Streets	AM
•	9th,Bryant Streets	AM
•	Fell,Gough Streets	PM
•	Duboce Ave,Guerrero Street	AM
•	Duboce Ave,Valencia Street	AM and PM
•	Duboce Ave,Otis,13th Streets	AM and PM

5.7 Land Use, Economic and Social Effects

Background and Existing Conditions

The project is located in a densely developed area west of downtown San Francisco and the Civic Center area. Commercial, light industrial and residential land-uses are all present within the project area. Background information was obtained from the 1990 U.S. census tracts corresponding to the project area: 162.98, 163, 168.98, 201.98 and 202.98. Exhibit 15 shows the boundaries of the study area U.S. census tracts.

The racial makeup of the area differs substantially by census tract. Census tract 163, located in the Western Addition, has a much higher African-American population than the other tracts studied and the city as a whole. The two tracts south of Market Street in the Mission District have a much higher Hispanic population than the other tracts and the city as a whole. The racial makeup of the



Central Freeway Replacement Project

Caltrans

Project Area Census Tracts

Exhibit 15

other tracts which include portions of the Hayes Valley and Upper Market neighborhoods are generally more reflective of the citywide profile.

The study area incomes are uniformly much lower than the city as a whole and correspondingly the incidence of poverty is much greater. Census tract 201.98 has an extremely low median household income and high percentage of unemployment, probably due in part to Valencia Gardens, a large public housing development. The percentages of unemployment for the other tracts are similar to the citywide percentage and show that many employed residents have low paying or marginal employment.

The great preponderance of housing units in the study area are multi-family dwellings, with a low incidence of owner occupied housing. Automobiles per household are very low relative to the city. The percentage of households working within San Francisco is very high relative to the city as a whole. Table 13 a-b provides a summary of the project area population characteristics from the U.S. census.

Several large institutions are located within the project area: University of California Extension and Dental School, Davies Symphony Hall, The S.F. Opera House, War Memorial Performing Arts Center (temporary home to City Hall). The French-American and Chinese International Schools will locate to 150 Oak Street in the Fall of 1997. The schools have a combined enrollement of over 800 students. Police services for the project area are provided out of Mission Station and Northen Stations. The Fire Department has a hazardous materials team response team located on Oak Street within the project area.

In the half mile between the 13th and Mission off-ramp and the Fell Street ramp, the Central Freeway weaves through the boundaries of three distinct neighborhoods: the Mission, Upper Market and Hayes Valley.

From the Mission, South Van Ness ramps, the viaduct passes over Valencia Street-the northern end of the Mission District. This area has a mix of light industrial, commercial and residential uses. With the opening of the housing development at the corner of McCoppin and Valencia Streets, the residential

presence in that area will increase. Transit service is provided by the number 26 Valencia Muni line, the F-line streetcar. The Muni Metro is within walking distance.

At Market Street, the viaduct crosses through the eastern edge of the Upper Market neighborhood, an active residential and commercial area with restaurants, cafes, bookstores, cleaners, a gas station, video and clothing stores and offices. Housing in the immediate area is characterized by large deco-era apartment buildings and Victorian flats. The University of California Extension, the University of California Dental School Clinic, and the future San Francisco Gay and Lesbian Community Center are all located within two blocks of the viaduct. These institutions draw faculty, staff and service users from within the city as well as the greater Bay Area. The Muni F line streetcar provides direct transit service through the area, with the Muni Metro, the 22 Fillmore and the 6, 7, 71 and 72 Haight Street lines in close proximity. Market Street is a designated bicycle lane in this area.

North of Market Street, the Viaduct crosses down Octavia Street between the Hayes Valley and Western Addition neighborhoods. The west side Octavia Street consists primarily of Victorian-era residences. The east side of Octavia Street is occupied by the remaining freeway structure. The core of the Hayes Valley commercial district, one block east of Octavia Street is formed by Gough, Franklin, Hayes and Grove Streets. The Muni 21 Hayes bus line, 42 Van Ness and the Muni Metro Van Ness Avenue station provide transit access to the area.

Economic and social effects of the project alternatives have the potential to extend beyond the immediate project neighborhoods. An informal survey of merchants' associations was conducted by Caltrans in March of 1997 in the central, western and northern parts of the city. The purpose of the survey was to elicit opinions regarding traffic and transportation effects of the closure of the Central Freeway. The information collected from these surveys is anecdotal. The survey does suggest that there have been changes in some commercial districts since the closure of the Central Freeway.

Table 13-a
Project Area Population Characteristics
1990 CENSUS DATA

CHARACTERISTIC	SAN FRANCISCO CITY & COUNTY	CENSUS TRACT 162.98	CENSUS TRACT 163	CENSUS TRACT 168.98	CENSUS TRACT 201.98	CENSUS TRACT 202.98
POPULATION	723,959	2,208	4.363	5.733	4,844	6,144
RACE						
White*	337,118	875	1,581	3,146	1,036	2,689
%						
%	47%	40%	36%	55%	21%	44%
Black*	76,343	428	2,089	1,560	233	520
%	11%	19%	48%	27%	5%	8%
Asian/Pacific Islander*	205,686	390	262	457	1,134	965
%	28%	18%	6%	8%	23%	16%
Hispanic (all races)	100,717	497	385	512	2,359	1,888
%	14%	23%	9%	9%	49%	31%
Other**	4095	18	46	58	82	82
%	1%	1%	1%	1%	2%	1%

*Non-Hispanic
** Includes American Indian, Eskimo, Aluet

Percentages may total more than `100% due to rounding

SOCIOECONOMIC						
Median Household Income	$45,664	$21,934	$214,179	$26,136	$16,711	$26,162
%Person Below Poverty Level	13%	25%	31%	17%	32%	21%

Table 13-b
Project Area Population Characteristics
1990 CENSUS DATA

CHARACTERISTIC	SAN FRANCISCO CITY & COUNTY	CENSUS TRACT 162.98	CENSUS TRACT 163	CENSUS TRACT 168.98	CENSUS TRACT 201.98	CENSUS TRACT 202.98
Persons over 16 in Labor Force	417,147	1,342	2.500	3,955	2,485	3,717
% Unemployed	6%	5%	7%	6%	11%	7%
%Population Over age 62	15%	7%	7%	9%	12%	11%
HOUSING						
Occupied Housing units	305,584	1,149	1,882	3,030	1,646	2,847
Single Family Units	105,150	21	153	171	53	98
Multi-Family Units	200,434	1,128	1,729	2,859	1,593	2,749
% Multi-Family Units	66%	98%	92%	94%	97%	97%
% Owner Occupied	35%	4%	12%	13%	5%	13%
Median Persons/ Unit	1.85	less than 1.5	1.86	1.51	1.83	1.61
TRANSPORTATION						
Vehicles per Household	1.1	0.5	0.7	0.7	0.4	0.6
% Journey to Work in San Francisco	80%	97%	88%	93%	88%	95%

According to the Caltrans survey, merchants associations in Japantown, Mid-Divisadero and Haight-Ashbury report that changes in access has resulted in negative business impacts. The degree and extent of these effects cannot be determined with available data. Merchants associations in outlying areas such as the Inner Sunset, Glen Park, Geary Boulevard and Noriega Street report increased traffic and negative business impacts. The merchants in the further western parts of the city, western Clement Street and the Taraval/Parkside area did not report any change in business volume, although they have experienced delays in the delivery of supplies.

Recreational destinations such as the Academy of Sciences in Golden Gate Park and the Exploritorium in the Marina District report decreased patronage since the closure of the Oak and Fell Street ramps.

The University of California, a major employer in the city, reports that employees have experienced time delays in their journey to work due to increased traffic congestion and the detours onto Ninth and Tenth Streets.

Alternatives 1A and 1B

These alternatives would restore service as it was prior to demolition of the upper deck. Because these alternatives would be constructed within the right-of-way of the former double-deck structure, there would be no direct or indirect land-use impacts. This access pattern is consistent with that which was in place for almost forty years prior to August 1996. The citywide economic impact of this alternative would be neutral.

Alternative 8B

Under this alternative, land-use conditions would remain as they are presently, until the freeway meets grade at Market Street. The viaduct crossing Market Street would be removed, opening up an unobstructed view of downtown. The presence of freeway ramps on Market Street will greatly increase cross traffic volumes in the immediate area. Though this will be a physical change from the existing condition, it is unlikely to have an adverse effect on business activity or the quality of life for residents in the Upper Market neighborhood.

Typically, direct freeway access to a commercial district benefits local businesses, assuming that parking is available. In this case, the lack of parking would negate any benefit derived by improved access. Because this community is pedestrian oriented and well served by transit and its businesses cater primarily to local residents, its continued economic health is not dependent on attracting automobile trips to the community. According to the Caltrans survey, the Association of Upper Market/Castro merchants have not been affected by the closure of the Central Freeway.

The removal of the Franklin and Gough Street ramps is credited for the economic revitalization of the Hayes Valley commercial district and this alternative is unlikely to reverse that trend. Because this area is in close proximity to Davies Symphony Hall, the Opera House and other cultural activities, clientele are drawn both the city and region. Parking structures are available nearby to accommodate visitors. The physical character of this area will change with the introduction of a 4-lane thoroughfare on Octavia Street. On balance, the effect on business in this area should be neutral to beneficial. The additional capacity provided on Octavia Street will relieve some of the traffic congestion that is now concentrated on Gough and Franklin Streets.

Residents on and in close proximity of Octavia Street viewing the 4-lane roadway will have a more physically attractive view, due to the elimination of the concrete overhead structure. This could have the effect of stimulating property values.

This alternative would alter the access patterns to the western part of the city that existed prior to August 1996. As stated above some business and organizations and in the central and western part of the city have stated there has been a decline in demand for services or attendance at certain venues. One method of estimating the economic impacts of a transportation project is to estimate travel times to a destination within a study area. This analysis assumes that relative travel times to a destination will influence the decision to travel to a given area. Once derived, these travel times can then be compared among the various alternatives to see changes in the travel time distances. Of course this analysis looks only at the time factor, other factors may also influence these decisions.

The closure of the Central Freeway removed the link that existed between Mission and Fell Streets and increased travel time between those points. The estimated travel time without the freeway between those points is 6.25 minutes during the AM peak hour and 9.4 minutes during the PM peak hour. Under Alternative 8B, with a freeway between Mission and Market Streets and roadway along Octavia Street, travel time would be 2.28 minutes in the AM peak and 3.68 minutes in the PM peak hour. These travel times compare favorably to alternatives 1A and 1B and the pre-closure condition of 1.55 minutes in the AM peak hour and 3.97 minutes in the PM peak hour.

When comparing these travel times between alternatives 1A and 1B to Alternative 8B, it should also be noted that available capacity on the facility between those points is about one third less under Alternative 8B. This means that about one third of the motorists will seek other routes to go to their destinations under this alternative. The resulting change in travel times for those individuals is not known. This analysis does show that for the majority of motorists, travel times are not greatly affected under Alternative 8B during peak hours.

Given that the recreational attractions in the western part of the city such as Golden Gate Park and its museums, Ocean Beach and the Cliff house are singularly unique destinations, demand to visit these venues is not likely to be affected by the additional travel time some will experience under Alternative 8B. It should be noted that a large number of the trips to these attractions occur outside of the "worst case" peak hour scenario. This has the effect of further reducing the number of individuals who might experience increased travel times when traveling to these destinations. In

short, the access provided to the western part of the city under this alternative would be an improvement over the condition that terminates the freeway at Mission Street. For these reasons, Alternative 8B will not have an adverse economic effect on the city For residents, the relatively small difference in travel time is unlikely to have any effect on residential location decisions in the western part of the city.

Alternative 10

This alternative would create some new development opportunities in a central part of San Francisco, with up over 2.42 hectares (6 acres) of land being declared surplus following demolition. The future use of these lands is not known. The City of San Francisco would be responsible for determining the uses that would be permitted on these lands and granting approval for subsequent development. It is reasonable to expect that since these are essentially in-fill lots, permitted uses would be generally consistent with those uses that exist on adjacent parcels.

Development of these lands would increase the real estate property tax base. To the extent that commercial development occurs, the city would also realize increased payroll taxes, licensing fees and sales tax revenues.

The social benefits accruing to residents in the project area resulting from removal of the overhead structure are difficult to assess. The removal of a physical barrier is a preferable condition from an urban design perspective, with the potential to create a more physically appealing community, encourage social interactions and promote economic development.

Under this alternative, the travel time between Mission and Fell Streets without a freeway segment would be about five minutes longer during both peak hours. Due to capacity constraints some individuals will experience longer or shorter routes depending on the alternative route available. There could be some citywide economic effects as a result of this alternative. Those and recreational destinations that have reported decreased patronage may continue to experience lower levels of activity.

As was stated above, most of the recreational attractions that draw non-residents to western part of the city are singularly unique. Even with the increased

travel time that would be experienced under this alternative, demand to visit these venues is not likely to change substantially. However, this alternative would result in the longest travel times to these destinations relative to the other alternatives under consideration. The anecdotal data suggests that in some areas there is a relationship between access to these businesses and recreational attractions and overall demand. The degree and extent of this relationship cannot be reliably quantified with existing data.

No Project Alternative

The No Project Alternative would provide northbound freeway service to Fell Street. Travel time from Oak to Mission Streets would be about five minutes longer for many motorists during the AM peak hour than it would be if there were a corresponding southbound ramp as part of the facility. Because the capacity of the facility is constrained, many motorists in morning peak hour trip could experience longer or shorter trips depending on the alternative routes selected. The PM peak hour trip between Mission and Fell would be reduced for most motorists by about five minutes due to an operable Fell Street off-ramp.

The commercial revitalization that has occurred in the Hayes Valley would not be reversed under this alternative. This alternative would decrease inbound travel times by about five minutes, possibly having a beneficial effect on those businesses and recreational attractions that have reported decreased patronage. The outbound travel time would continue as described for Alternative 10. This alternative would have a neutral impact on the economy of the city.

5.8 Right-of-Way

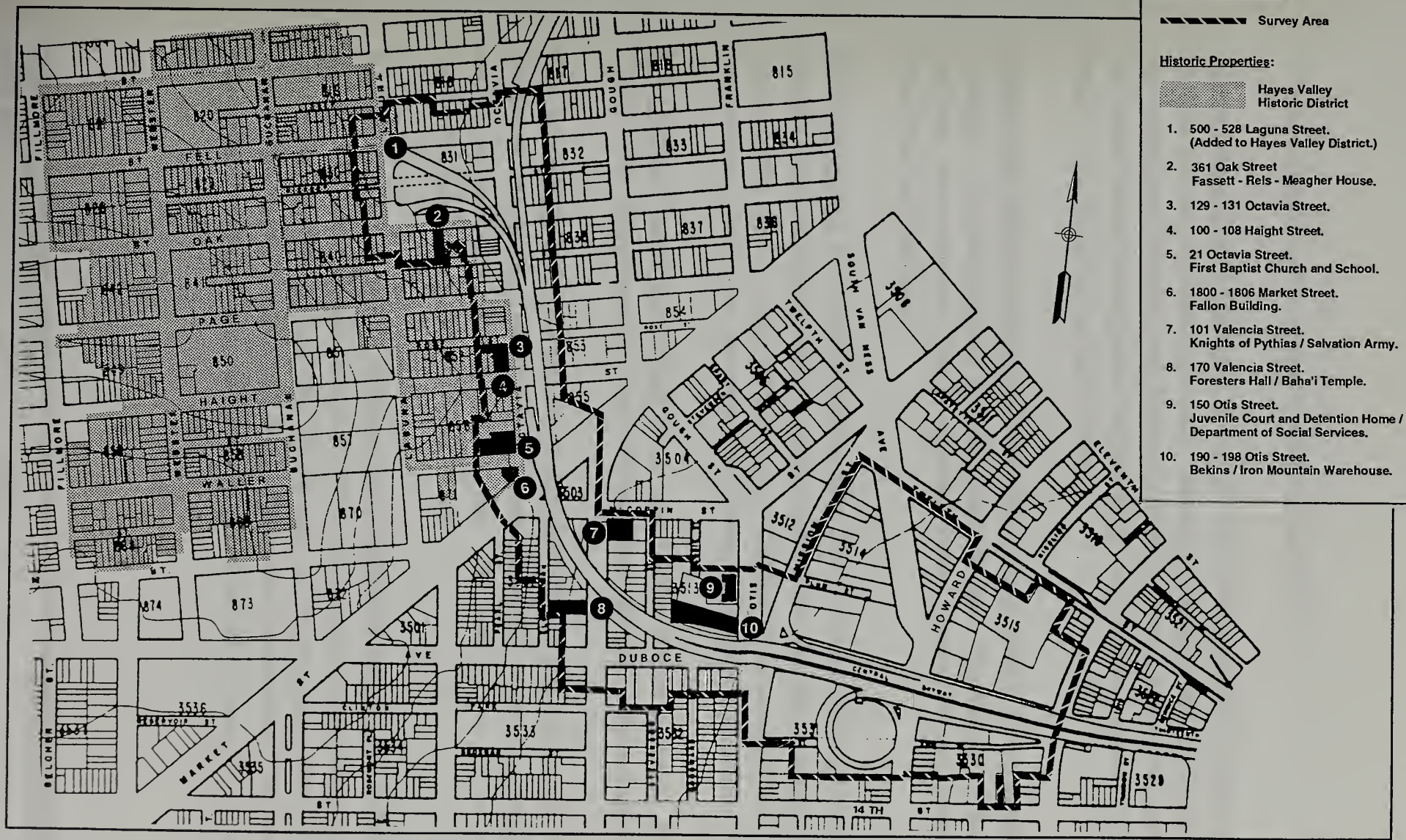
None of the proposed alternatives will require the acquisition of right-of-way. Construction activities will cause temporary street closures and increased noise and dust for intermittent and varying durations of time.

5.9 Architectural Resources

The project passes though the Mission District, Upper Market and Hayes Valley neighborhoods. The Hayes Valley portion of the project area was largely built-up as a residential neighborhood by the late 1880s. The fire following the earthquake of April 1906 was extinguished roughly along the line of Octavia Street, preserving many of the buildings west of Octavia Street from Market Street north.

In contrast to the area north of Market Street and west of Octavia, the 1906 fire consumed almost all of the buildings south of Market. The neighborhood south of Market, once a mixture of residences, shops and industry took on a decidedly industrial appearance as a result of post-1906 earthquake reconstruction.

To study potential project effects on historic properties, an Area of Potential Effect (APE) was established that took into account all of the alternatives under consideration. Based on extensive field and archival research, nine historic properties are potentially eligible for listing in the National Register of Historic Places. In addition, the Hayes Valley Historic District has been previously determined eligible. Exhibit 16 shows the APE and the locations of the potential National Register eligible properties.


Survey Area
Historic Properties:
Hayes Valley Historic District
1. 500 - 528 Laguna Street. (Added to Hayes Valley District.)
2. 361 Oak Street Fassett - Reis - Meagher House.
3. 129 - 131 Octavia Street.
4. 100 - 108 Haight Street.
5. 21 Octavia Street. First Baptist Church and School.
6. 1800 - 1806 Market Street. Fallon Building.
7. 101 Valencia Street. Knights of Pythias / Salvation Army.
8. 170 Valencia Street. Foresters Hall / Baha'i Temple.
9. 150 Otis Street. Juvenile Court and Detention Home / Department of Social Services.
10. 190 - 198 Otis Street. Bekins / Iron Mountain Warehouse.
HAIGHT
OAK
FELL
PAGE
WALLER
DUBOCE
MARKET
HOWARD
OTIS
GOUGH
FRANKLIN
OCTAVIA
VAN NESS
FILLMORE
LAGUNA
14 TH

Central Freeway Replacement Project

Caltrans

Project APE and Locations of National Register Eligible Properties

Exhibit 16

A brief description of the properties is provided below:

Hayes Valley Historic District c. 1870-1910. This area bounded by Fillmore, Hermann, Octavia and Grove Streets, previously determined eligible the for National Register for its wealth of Victorian and Edwardian architecture. Caltrans staff concludes that the district should be expanded slightly on its east side to include 500-528 Laguna Street, an apartment house built in 1912.

Fassett-Reis Meagher House, 361 Oak Street c. 1866-1869. This property is a fine example of a free-standing Italianate style house. Situated on a large lot, the building was constructed before attached houses became the standard residential type in this neighborhood.

Flats and House, 100-108 Haight Street and 129-31 Octavia Street; architects John J. Newsom and John Gash, 1883. The property embodies characteristics of the Italianate architectural style. The building was designed by a member of a Bay Area architectural dynasty and the architectural design possesses high artistic values.

First Baptist Church and School, 21 Octavia Street; architects Wright, Rushforth & Cahill, 1910. This property is distinct for its Classic Revival architectural style.

Fallon Building, 1800 Market Street, architect Edward B. Goodrich, 1894. This property is an excellent example of a Queen Anne style mixed-use building which marks the surviving edge of the 1906 fire. This building is also a contributing element of the Hayes Valley Historic District.

Knights and Daughters of Pythias Castle/Salvation Army, 101 Valencia Street; architects Charles Paff and John Baur, 1910. This property was determined eligible for the National Register in 1993 for its role in San Francisco social and cultural history as a fraternal lodge, and later a benevolent association. The property will retain National Register eligibility after the rehabilitation in progress is completed.

Independent Order of Foresters Hall/ Bahai'i Temple, 170 Valencia Street; architect Harold G. Stoner, 1930. This property is distinguished for its fine representation of the Art Deco style.

Bekins Company Warehouse, 190 Otis Street; architects Ralph Warner Hart, George W. Applegarth, 1905-1909. This property is noted for its method of construction, an early use of reinforced concrete. This method was developed by the architect shortly before the 1906 and later became the standard for fireproof construction.

San Francisco Juvenile Court and Detention Home, 150 Otis Street; architect Louis Christian Mullgardt, 1916. This is a significant work by the eminent San Francisco architect.

Each of the properties were evaluated using the federal criteria of effect to determine how a particular alternative would affect a given property, the following determinations can be made using these criteria: adverse effect, no adverse effect, no effect. Under federal criteria, an adverse effect would occur if there physical destruction or alteration of the property; introduction of intrusive elements or isolation of the property.

It was determined that none of the alternatives under consideration would have an Adverse Effect on any National Register eligible properties identified within the project APE. In the case of Alternative 10 and the No Project Alternative, there would be no effect on any historic properties.

With respect to Alternatives 1A, 1B and 8B, the change in proximity of the proposed freeway structure in relation to an historic property was critical in determining effect. In most cases, the proximity of the proposed freeway structure resulted in no adverse effect or no effect on the historic properties.

Tables 14 below compare the distances between the existing and proposed structure in relation to potentially eligible properties for proposed alternatives 1A, 1B and 8B. Those properties not listed in the table were found to have no effect.

Table 14

Alternative 1A
Estimated Change in Distance of Eligible Properties from Freeway Structure and Finding of Effect

Eligible Property	Existing Distance From Freeway	Proposed Distance Proposed from Freeway	Increase, decrease proposed by Alternative	Criteria of Effect Finding
Reis-Meagher House	30.48 m (100')	22.86 m (75')	+7.62 m (25')	NAE
101-108 Haigh Street 129-131 Octavia	33.52 m (110')	25.90 m (85')	+7.62 m (25')	NAE
First Baptist Church	24.38 m (80')	25.90 m (85')	-1.52 m (5')	NAE
Fallon Building	27.43 m (90')	25.90 m (85')	+ 1.52 m (5')	NAE
Salvation Army	35.05 m (115')	30.48 m (100')	+ 4.57 m (15')	NAE
Foresters Hall	13.76 m (45')	12.19 m (40')	+1.52 m (5')	NAE

Table 15
Alternative 1B
Estimated Change in Distance of Eligible Properties from Freeway Structure and Finding of Effect

Eligible Property	Existing Distance From Freeway	Proposed Distance Proposed from Freeway	Increase, decrease in Distance by Alternative	Criteria of Effect Finding
Reis-Meagher House	30.48 m (100')	25.90 m (85')	+ 4.57 m (15')	NAE
101-108 Haight Street, 129-131 Octavia	33.52 m (110')	33.52 m (110')	0	NAE
First Baptist Church	24.38 m (80')	27.43 m (90')	+3.04 m (-10')	NAE
Fallon Building	27.4 m (90')	25.90 m (85')	-1.52 m(5')	NAE
Salvation Army	35.05 m (115')	30.48 m (100')	+4.57 m (15')	NAE
Foresters Hall	13.71 m (45')	9.14 m (30')	- 4.57 m (15')	NAE

Table 16
Alternative 8B
Estimated Change in Distance of Eligible Properties from Freeway Structure
and
Finding of Effect

Eligible Property	Existing Distance From Freeway	Distance From Proposed Freeway Structure	Increase,decrease proposed by Alternative	Criteria of Effect Finding
Salvation Army	35.03 m (115')	28.96 m (95')	+6.09 m (20')	NAE
Foresters Hall	13.71 m (45')	10.66 m (35')	+3.04 m (10')	NAE
Bekins Company	7.62 m (25')	6.09 m (20')	+1.52 m (5')	NAE

No mitigation is required as none of the proposed actions would result in an Adverse Effect to any of the historic properties in the APE. When pile driving occurs within 25.90 meters (85') of a building, construction monitoring procedures will be initiated to guard against potential damage due to vibration. If vibrations approach the level of potential damage, the construction activity would be modified to avoid the potential for damage. Those historic buildings within that range will be subject to the monitoring protocol.

5.10 Archaeological Resources

The APE established for archaeological resources consists of those areas where the potential for ground disturbing activities exists. The APE includes areas within the right-of-way, plus adjacent areas that may be used for construction staging.

Based on a search of the archaeological records, it appears that no known archaeological site exists within the project APE, nor has the area ever been the subject of an archaeological survey. It is possible that prehistoric archaeological sites and likely that historic period archaeological sites are located within the APE. No field reconnaissance has been undertaken because the entire area is currently paved and possibly buried under a substantial layer of fill.

When a project alternative is selected, an Archaeological Research Design And Treatment Plan will be prepared. The plan will specify the procedures to identify, evaluate and treat the potential prehistoric and historic archaeological sites that may be encountered during construction. In addition, mitigation measures will also be described in the event that National Register archaeological sites are affected.

5.11 Hazardous Materials

In order to determine the potential for hazardous or contaminated materials in the project area, an Initial Site Assessment (ISA) was prepared. The ISA consists of a record search and a visual inspection of the subject area. Based on the information collected for the ISA, no overt signs of contamination are present in the project area.

The potential for soil contamination is minimal in most of the project area. The blocks bounded by Guerrero, Market, Valencia and Duboce Streets and Valencia, McCoppin, Otis, Duboce Streets may have a somewhat higher possibility of soil contamination than other areas because of previous land-uses on or adjacent to the affected area. The blocks bounded by Mission, Plum, South Van Ness, 13th Streets and Mission,13th,South Van Ness, 14th Streets have a substantially greater possibility for soil contamination due to previous land-uses on or adjacent to the affected area.

In San Francisco, there is always a possibility of soil contamination owing to the widespread use of lead paint, lead pipes and the indiscriminate use of material for fill and other factors. Lead concentrations higher than would expected given the historic land-uses have been found within the project area. As warranted by applicable laws and regulations, it is recommended that testing be done in these areas.

During construction, measures to handle contaminated and, or hazardous materials will include placing air monitoring equipment on the site to detect if their are concentrations of concern. Construction methods will be modified in the event that high levels are detected. The site will be frequently watered during construction to contain soils. Excavated materials will be taken away in trucks covered with tarps. These measures will be included in Caltrans Construction Specifications.

5.12 Energy

Energy expenditures for this project vary widely depending on the alternative selected. When analyzing energy, construction and maintenance and operation expenditures are compared to the No Project Alternative.

The energy necessary to construct alternatives 1A, 1B and 8B would be substantial when compared to Alternative 10 and the No Project Alternative. On going maintenance of the facility, takes into account energy used by the vehicle fleet and the size and condition of the facility. Alternatives 1A and 1B would be more efficient to operate and consume less energy among the alternatives. Alternative 8B and the No Project Alternative would consume comparable amounts of energy and more than alternatives 1A and 1B for overall operation. Alternative 10 would require the greatest amount of energy resources for operation.

When accounting for both operation and maintenance, alternatives 1A and 1B would expend the least amount of energy among the alternatives. The overall efficiency gain in the operation of Alternatives 1A and 1B would have only limited impact on fuel conservation because of the relatively short length of roadway involved. Over the life of the project, the amount of reduction achieved in direct energy use under these two alternatives would be hardly enough to offset the energy consumed in the project's construction.

When comparing alternatives, the No Project Alternative would have the lowest total energy expenditure. The TMP elements that are currently in place and the TSM measures that are proposed as a component of alternatives 8B and 10 would help in conserving energy.

5.13 Conclusion

Based on the analysis of resources that potentially could be affected by this project, it can be concluded that none of the proposed project alternatives would have a significant effect on the environment.

6.0 CONSULTATION AND COORDINATION

There has been a high degree of public participation in this project. The primary vehicle for community input and response has been the Citizens' Advisory Task Force for the Central Freeway, appointed by the San Francisco Board of Supervisors. Ten task force meetings were held between April and September of 1995. These meetings were "hands-on" technical sessions with the Wilbur Smith Associates consultant team, members of the public and representatives from various city departments and Caltrans.

In conjunction with the Task Force meetings and community workshops, a Technical Advisory Committee (TAC) comprised of representatives of public agencies participated in the study.

In order to ensure that as many members of the public as possible were aware of the Central Freeway study, a variety of community outreach techniques were utilized. These included press releases, newsletters, paid advertisements in citywide and local neighborhood newspapers, advertisements in "Community Calendar" section of newspapers. A telephone information and comment line was instituted and special signs were posted on major streets within the Central Freeway corridor. Task Force members also participated in community outreach by attending various community meetings and by posting and distributing meeting notices throughout their neighborhoods. A Spanish language Central Freeway information line went into service in August, 1995.

In addition to Task Force meetings and workshops, five public meetings regarding the Central Freeay have been held at various locations throughout the city on the following dates:

May 18, 1995
September 14, 1995
June 4, 1996
June 5, 1996
November 20, 1996

7.0 BIBLIOGRAPHY

The following technical studies were prepared for the Central Freeway Replacement Project Environmental Assessment:

Traffic Operations Analysis Report, March 1996

Preliminary Geotechnical Report, March 1996

Noise Impact Report, March 1996

Energy Conservation Report, March 1996

Air Quality Impact Report, March 1996

Visual Impact Assessment, March 1996

Cultural Resources Impact Memorandum, March 1996

Right-of-Way Impact Report, March 1996

8.0 LIST OF PREPARERS

Document Preparation and Coordination

Jared Goldfine, AICP
Associate Environmental Planner
B.A., Economics; Certificate Land-Use Planning
16 year urban and environmental planning experience

Robert Gross
Chief, Office of Environmental Planning
Ph. D. Social Anthropology
15 years environmental planning experience

Geotechnical and Seismic

Betty Lee
Associate Materials and Research Engineer
B.S., Civil Engineering
12 year civil engineering experience

Grant Wilcox
Associate Materials and Research Engineer
B.S., Civil Engineering
7 years geotechnical Experience

Air Quality

Victor Zeuzem
Senior Environmental Engineer
Registered Professional Civil Engineer
12 years experience in environmental engineering

Chris Corwin
Associate Transportation Engineer
B.S. in Mathematics
9 years experience in environmental engineering

Noise

Chris Corwin
(see above, air quality)

Adrian Custodio
Associate Transportation Engineer
B.S. Civil Engineering
16 years experience

Visual Resources

Keith Suzuki
Associate Landscape Architect
B.A., Landscape Architecture
8 years experience in landscape architecture and visual assessment

Cheryl Nevares
District Branch Chief, Landscape Architecture
17 years experience in landscape architecture and visual assessment

Traffic and Circulation

Michael Wilkes
Transportation Engineer
18 years experience in traffic operations

Rod Otto
Senior Transportation Planner
Registered Professional Engineer
B.S., Civil Engineering
17 years experience in traffic operations

Lance Hall
Transportation Engineer
Registered Professional Engineer
B.S., Civil Engineering
3 years experience in traffic operations

Suresh Shah
Transportation Engineer
Registered Professional Engineer
B.S., Civil Engineering
17 years experience in traffic operations

Mike Kerns
Transportation Engineer
Registered Professional Engineer
B.S., Civil Engineering
7 years experience in traffic operations

Land Use, Economic and Social Effects

Jim Durkee
Associate Environmental Planner
B.A., Economics
14 years experience in transportation planning

Jared Goldfine, AICP
(see document preparation and coordination above)

Right-of-Way

Don Stratton
Associate Right-of-Way Agent
B.S., Business Administration
17 years right-of-way experience

Architectural Resources

Elizabeth Krase
Architectural Historian
M.A., American Studies
11 years experience in architectural and historical studies

Elizabeth McKee
M.A. History
15 years architectural and historical studies

Andy Hope
Architectural Historian
M.A. Architecture
8 years experience in historic architecture studies

Hazardous Materials

Howell Chan
Associate Environmental Planner
M.S. Environmental Management
10 years environmental studies experience

Energy

Shiang Yang
Associate Transportation Engineer
M.S., Civil Engineering
4 years environmental studies experience

Graphics

Rachel Garth

Administrative Support

Manel Wijekoon
Carol Williams